ECONOMIC RESILIENCE AND THE ROLE OF FISCAL POLICY IN THE ASEAN – 5 COUNTRIES

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By

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ABSTRACT

ASEAN–5 countries are vulnerable to external shocks as these countries are highly integrated with external markets through international trade and foreign capital flow. These countries have experienced huge negative economic impact during the Asian Financial Crisis (AFC) and the Global Financial Crisis (GFC). The aim of this study is to evaluate the economic resilience in the ASEAN–5 countries, to examine the role of fiscal policy as a shock – absorber and, to determine the effectiveness of fiscal policy in stabilizing the economy during the AFC and the GFC. The Ordinary Least Square (OLS) with robust standard error and Autoregressive Distributed Lag (ARDL) analyses are used in the estimation using time series data for the period of 1981 – 2014. The result reveals that Thailand has the highest shock amplification impact among the countries. For shock persistent dimension, Singapore is the highest among the countries. The finding also indicates that automatic stabilizer plays a shock absorber role for all countries. For discretionary fiscal tool, the result shows that it could play a role as a shock absorber in Malaysia, Singapore and Thailand but not for Indonesia and the Philippines. Furthermore, the result reveals that the impact of automatic stabilizers on the economy was effective during the AFC for all countries except for the Philippines. Discretionary fiscal tool is found to be effective for Singapore and Thailand but ineffective for Malaysia, Indonesia and the Philippines during the AFC. During the GFC, automatic stabilizers are effective for all countries except for Thailand. In contrast, discretionary fiscal tool is found to be ineffective for all countries. In the context of policy implication, the study recommends strengthening trade and financial integration among ASEAN members which could reduce external vulnerability and increases economic resilience.

Keywords: economic resilience, economic stability, automatic stabilizers, and discretionary fiscal tool

ABSTRAK

Negara - negara ASEAN–5 terdedah kepada kejutan luaran kerana penglibatan tinggi negara - negara ini dalam pasaran luaran menerusi perdagangan antarabangsa dan aliran modal asing. Negara – negara ini telah mengalami kesan negatif yang besar semasa Krisis Kewangan Asia (KKA) dan Krisis Kewangan Global (KKG) berbanding rantau lain. Matlamat kajian ini adalah untuk menilai daya tahan ekonomi di negara – negara ASEAN – 5 daripada perspektif kestabilan ekonomi, menguji peranan polisi fiskal sebagai penyerap kejutan dan menentukan keberkesanan polisi fiskal untuk menstabilkan ekonomi semasa KKA dan KKG. Analisis – analisis *Ordinary Least Square (OLS) with robust standard error* dan *Autoregressive Distributed Lag (ARDL)* digunakan dalam penganggaran menggunakan data siri masa bagi tempoh 1981 -2014 untuk setiap negara ASEAN–5. Keputusan kajian mendedahkan Thailand mempunyai kesan penguatan kejutan tertinggi dalam kalangan negara – negara ASEAN–5. Untuk dimensi ketegaran kejutan, Singapura ialah yang tertinggi dalam kalangan negara – negara ASEAN–5. Dapatan kajian menunjukkan penstabil automatik memainkan peranan sebagai penyerap kejutan untuk semua negara ASEAN-5. Untuk alat fiskal budi bicara, dapatan kajian menunjukkan bahawa alat tersebut boleh memainkan peranan sebagai penyerap kejutan di Malaysia, Singapura dan Thailand tetapi tidak boleh memainkan peranan sebagai penyerap kejutan di Indonesia dan Filipina. Selain itu, penganggaran, keputusan kajian mendedahkan kesan penstabil automatik terhadap ekonomi adalah berkesan semasa KKA bagi semua negara ASEAN–5 kecuali Filipina. Alat fiskal budi bicara didapati berkesan untuk Singapura dan Thailand tetapi tidak berkesan bagi Malaysia, Indonesia dan Filipina semasa KKA. Semasa KKG, penstabil automatik adalah berkesan untuk semua negara ASEAN kecuali Thailand. Sebaliknya, alat fiskal budi bicara didapati tidak berkesan untuk semua negara ASEAN-5. Dalam konteks implikasi polisi, kajian ini mencadangkan pengukuhan integrasi perdagangan dan kewangan dalam kalangan negara -negara ASEAN-5 yang boleh mengurangkan kebolehancaman luaran dan meningkatkan daya tahan ekonomi.

Kata kunci: daya tahan ekonomi, kestabilan ekonomi, penstabil automatik, dan alat fiskal budi bicara

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CHAPTER 1

INTRODUCTION

1.1 Background of the Study

The five largest economies in Southeast Asia are Malaysia, Indonesia, Singapore, Thailand and the Philippines. They are known as the ASEAN – 5. They are not only tied together by multiple threads of history and culture, but also increasingly linked by business networks, trade relationships, migration, and shared resources. This region is appeared to capture a large share of global trade flow as it is deeply interconnected with huge volumes of goods, services, and capital moving across borders (McKinsey Global Institute, 2014). This region has been built based on a diverse economy background which can be seen in Table 1.1.

The GDP growth reflect the reflect the economic performance of a country in a particular year. Table 1.1 shows that GDP growths in Malaysia and the Philippines have increased from 2005 to 2010 but decreased during 2015. Meanwhile, GDP growths in Singapore, Thailand and Indonesia posed a decreasing trend from 2005 to 2015. This trend was due to increasingly external risks that undermined economic performance over years.

Table 1.1:
The Characteristics of ASEAN – 5 Economies, 2005, 2010 and 2015

Aspect	Indonesia			Malaysia			Philippines			Singapore			Thailand		
	2005	2010	2015	2005	2010	2015	2005	2010	2015	2005	2010	2015	2005	2010	2015
GDP growth (%)	5.69	6.22	4.87	5.33	7.42	5.09	4.77	7.63	6.06	7.35	14.52	2.89	4.18	7.51	3.13
Unemployment rate (%)	11.2	7.1	5.8	3.2	2.1	3.0	11.3	7.3	6.8	2.2	2.8	3.2	1.8	1.1	0.8
Inflation rate (%)	10.5	5.1	6.8	3.5	3.3	2.7	6.5	3.7	2.8	0.4	2.8	1.0	4.5	3.2	1.9
Fiscal balance to GDP ratio (%)	0.4	-1.2	-2.3	-2.9	-4.6	-3.6	-1.7	-2.3	0.5	16.9	21.7	16.6	1.4	- 0.8	-1.8
Interest Rate (%)	14	13.2	12.7	5.9	5	4.5	10.1	7.6	5.6	5.3	5.3	5.4	5.8	5.9	6.6
Total Domestic Credit to GDP (%)	26.4	27.2	36.4	106	107	120	29	29.5	35.1	89.4	96.2	130	93.8	115	146
Total Trade to GDP (%)	63.9	46.7	48	203	157	138	97.8	71.4	61.4	422	373	362	137	127	132
Public debt to GDP ratio (%)	42.6	24.5	25.9	42.7	53.5	56.6	59.1	43.4	35.4	92.1	97.7	98.7	47.3	42.6	47.5

Source: World Economic Outlook (WEO), 2015

The inflation rate in Table 1.1 shows that a sustained increasing in the general price level of goods and services in an economy over a period of time (Blanchard & Johnson, 2013). A high inflation rate indicates that a highly living cost that can undermine the standard of living of a society and welfare in a country. It shows that inflation rates of Malaysia, Thailand, Singapore and the Philippines remain low and below than three percent. These rates are considered as mild inflation rate that do not harm the economies (Lim & Sek, 2015). In contrast, the inflation rate of Indonesia is higher than three percent which reflects a high living cost in the country.

Meanwhile, unemployment rate indicates the percentage of unemployed labor force in a country. Table 1.1 shows that the unemployment rates of Malaysia, Thailand and Singapore is below five than percent. These countries already achieved full employment level, by adapting the setting of natural unemployment rate in United State case by Fed Reserve (2019) which is given in range 3.74 to 4.5 percent. However, unemployment rates of the Philippines and Indonesia are much higher and above than four percent. This figure implies that these countries did not achieve full employment. This condition reflects a high poverty rate that brings harm to welfare of the countries.

Fiscal balance (government revenue minus government expenditure) to GDP ratio refers to which extend a government has additional financial resources to deliver fiscal policy to counteract with shocks (Aiginger, 2009). Table 1.1 shows that the fiscal balance to GDP ratio of Singapore remains at surplus position. It will increase the ability of the country to deliver a fiscal policy during economic shocks. However, a high public debt to

GDP ratio of Singapore can reduce government revenues and fiscal surplus position overtime. In contrast, fiscal deficit to GDP ratio and public debt to GDP ratio of Malaysia are much higher than other countries. It can undermine the ability of the country to deliver a fiscal policy during economic shocks (Kawai & Morgan, 2013).

Moreover, interest rate in Table 1.1 shows that the cost of borrowing loan which influences investment level in a country. Interest rates in most ASEAN – 5 countries stay below than 10 percent. However, interest rate of Indonesia is 12.6 percent and higher than other countries. Therefore, it will increase the cost of borrowing, reduce demand on loans and decrease investment level in the country (Taylor, 1999).

In addition, total domestic credit to GDP ratio in Table 1.1 represents financial development level. It refers to a financial market that ease the effect of information, enforcement and transaction costs which contributes to an effective and efficient key function of financial sector in economy (The World Bank, 2015). In a high financial development, it allows more total credit made by financial institution and promotes more capital accumulation and investment. Table 1.1 exhibits a high total domestic credit to GDP ratios in Malaysia, Singapore and Thailand implying that financial market of these countries is highly developed. In contrast, low total domestic credit to GDP ratios in the Philippines and Indonesia denote a low financial development. Credit made by financial institution in the countries can be limited which is less supportive to investment climate.

Meanwhile, economic openness is represented by total trade (total import plus total export) to GDP ratio in Table 1.1. It shows that to which extent an economy is being exposed to external market through international trade (Giovanni & Levchenko, 2008). Table 1.1 shows that total trade to GDP ratios are high in Malaysia, Singapore and Thailand. It implies that the countries are highly depending on international market. In contrast, the total trade to GDP ratios of Indonesia and the Philippines are much lower. It means that the countries are less relying on international market.

1.1.1 Economic Resilience in the ASEAN – 5 Countries

Economic resilience is defined as the ability of an economy to react with external and internal shocks. It consists of process to withstand with the shocks and, to recover quickly from the shocks. It means that the economy is able to recapture its pre – existing state after shock (Guillaumont, 2009; Briguglio et al., 2009). The ability of a region to cope with shock can be seen by perceiving its economic performance through economic shocks. According to Foster (2008), if the average economic growth after shock is equal to or, exceeds average economic growth before shock, the economic is considered to be resilient. It implies that the economy is able to cope with shock which leads to achieve pre – shock level. The economic performance of ASEAN – 5 countries during Asian Financial Crisis (AFC) (1998 – 1999) and Global Financial Crisis (GFC) (2008 – 2009) since last two decades can be given in Table 1.2 and Table 1.3.

Table 1.2
The Impact of Economic Crisis in ASEAN-5 Countries on Export and Investment Level

	Real Export Growth (percent)		Gross Domestic Capital Formation Growth (percent)	
	AFC	*GFC*	*AFC*	*GFC*
	1998-1999	2008-2009	1998-1999	2008-2009
Indonesia	9.5	-9.6	-33.0	3.29
Malaysia	3.0	-10.8	-42.9	-2.71
Philippines	-1.9	-7.8	-11.1	-1.74
Singapore	3.0	-7.6	-5.25	-3.19
Thailand	7.7	-12.5	-44.0	-10.8

Source: WEO, 2015 and Asian Development Bank (ADB), 2015

Table 1.3
Economic Growth in ASEAN-5 Countries, 1994 – 2015 and Output Losses during AFC and GFC

	Average Real GDP Growth (percent)					Output Losses (USD billion)	
	Before AFC	*AFC*	*After AFC*	*GFC*	*After GFC*	*AFC*	*GFC*
	1994-1997	1998-1999	2000-2007	2008-2009	2010-2015		
Indonesia	7.1	-13.1	5.1	4.6	5.6	126.3	-31.4
Malaysia	9.1	-7.4	5.6	-1.5	5.6	13.7	3.6
Philippines	5.0	-0.6	4.9	1.1	6.1	0.6	-2.1
Singapore	8.4	-2.2	6.4	-0.6	3.9	2.6	1.2
Thailand	7.3	-7.6	5.3	-0.9	3.6	46.3	2.4

Source: ADB, 2015 and World Bank, 2015
Note: Output losses is calculated by summing the declining growth in real GDP during AFC and GFC period.

During AFC, there was a sudden withdrawal of USD36 billion capital from the region. It caused a steep depreciation in local currency and, uncertainties and volatilities in foreign exchange. It was due to the deleveraging[11] of international commercial banks on Asian

[1] Deleveraging refer to the action of international banks to reduce percentage of debt in balance sheet by immediately selling their assets which in turn lead to a high capital fled from the crisis -affected country. If unable to do so, the bank may be in position that increase its risk of default.

countries (ADB, 1999). As a result, as seen in Table 1.2, gross domestic capital formation was sharply contracted in Indonesia (33 percent), Malaysia (42.9 percent), Singapore (5.3 percent), Thailand (44 percent) and the Philippines (11.1 percent). Therefore, AFC caused a declining in the real GDP growth of ASEAN – 5 countries which can be seen in Table 1.3. The table shows that Indonesia was the most affected country with the highest declining in GDP growth by 13.1 percent with the US$126 billion of output loss. It was followed by Thailand with GDP growth contraction as much as 7.6 percent. In contrast, the Philippines was the least affected by the crisis with a small contraction in GDP growth, 0.6 percent.

Table 1.3 also shows that economic growth rates at post – AFC (2000 – 2006) of the ASEAN – 5 countries were lower than their pre – crisis growth rates. This scenario was due to the uncertainties of global political condition such as terrorist attack on 11th September 2001 and war in Afghanistan and Iraq that contributed to a low investment level persistently (ADB, 2003). These uncertainties prevented the ASEAN – 5 countries to recapture pre – crisis growth thus, became less resilient.

Meanwhile, GFC was caused by sub – prime mortgage crisis in the United State of America (US) and scattered the effect across the globe. The GFC was also accompanied by large global imbalances, collapsed export and weakened of market confidence in Asian countries (Raj & Roy, 2014). As shown in Table 1.1, the crisis has reduced export growth in Malaysia (10.8 percent), Thailand (12.5 percent), Indonesia (9.6 percent), the Philippines (7.8 percent) and Singapore (7.6 percent). It was also accompanied by the

decreasing of gross domestic capital formation in Malaysia (2.7 percent), Singapore (3.2 percent), Thailand (10.8 percent) and the Philippines (1.74 percent).

As shown in Table 1.2, Malaysia was the most affected country since it recorded a GDP growth contraction by 1.5 percent during GFC. In contrast, the increasing of GDP growth has been recorded in Indonesia, 4.6 percent and the Philippines, 1.1 percent which were strongly supported by the growth of domestic demand such as private consumption despite, the country endured a declining in export growth and fixed capital formation (ADB, 2009).

Table 1.2 also shows that growth rates at post – GFC (2010 – 2015) of Malaysia, Indonesia and the Philippines are equal to their growth rates before GFC. It implies that these countries are resilient to GFC. It was due to a robust in domestic demand that helped Malaysia, Indonesia and the Philippines to promote economic growth rate and recapture their pre – GFC growth rate (ADB, 2014). Meanwhile, political unrest that disrupted economy in Thailand and, the slowdown of export demand in Singapore have contributed to a lower growth rate than their pre – GFC period growth rate (ADB, 2016). It implies that both countries were less resilient.

1.1.2 Economic Stability and Economic Resilience

One of the measurement of economic resilience is economic stability. Economic stability is defined as a situation which an economy has a strong economic background that reduces vulnerability to external shocks (Briguglio et al., 2009). In this definition, vulnerability pertains the exposures of the economy to shock whereas, the strong economic background is subjected to low inflation rate and unemployment rate. It is difficult to endure with economic shocks if the economy condition already at high levels of unemployment rate and inflation rate. From Keynesian view point, this condition would impose a high uncertainty and risk in the economy that increases pessimism behaviour of household and firms. Therefore, it would increase vulnerability to shock and exacerbate the effect of shocks on the economy (Pindyck, 1991; Mankiw, 2003; Tsouma 2014).

Based on the engineering economy resilience approach, economic stability is described as to which extent an economy to stay at equilibrium path in dealing with shocks (Simmie & Martin, 2008). Exogenous shocks could deviate the economy from the equilibrium path. To be resilient, the economy must return to equilibrium or steady state and eventually, leads to achieve economic stability. According to Debrun and Kapoor (2010) and Fatàs and Mihov (2012), economic stability is manifested by the stability of aggregate output around potential output in the business cycle.

In the business cycle, shocks in aggregate demand (AD) cause aggregate output to be diverged from equilibrium at the potential output path. Thereby, it is resulting the

fluctuations of aggregate output in the business cycle (Mankiw, 2015). For instance, a declining in AD will reduce actual output below than potential output. In this regard, the returning process of aggregate output toward potential output indicates that the shock is being absorbed hence, it leads the economy to be resilient (Briguglio et al., 2009; Aiginger, 2009).

Output fluctuation in the business cycle is measured by output gap. It is commonly used to reflect cyclical trend in an economy. It is the difference between aggregate output and potential output[2]. In this respect, the percentage output gap to potential output shows to which extent aggregate output to be near to potential output including during shock such as AFC and GFC. Negative output gap to potential output indicates that the economy experiences economy recession or economy slowdown where aggregate output is below than potential output. In contrast, positive output gap to potential output indicates the economy experiences economic booming where the economy attains aggregate output above than potential output. The stability of the ASEAN – 5 region can be described by Figure 1.1.

As shown in Figure 1.1, the ASEAN – 5 region was less resilient compared to other regions during AFC. The crisis caused the region to be thrown off from potential output by 18.2 percent which it was larger than East Asia, Central Asia, and Advanced Countries (G – 7). Furthermore, the region did not quickly attain to potential output after AFC (2000

[2] Maximum goods and services can be produced when an economic at full capacity or full employment (Jahan & Ahmed, 2013)

– 2006). It was caused by global uncertainty factors such as terrorist attack on 11th September 2001, respiratory syndrome (SARS), war in Afghanistan and Iraq that weakened investment climate, discouraged private investment to the region and prolonged aggregate output below the potential output (ADB, 2003; Thangavelu & Chongvilaivan, 2007).

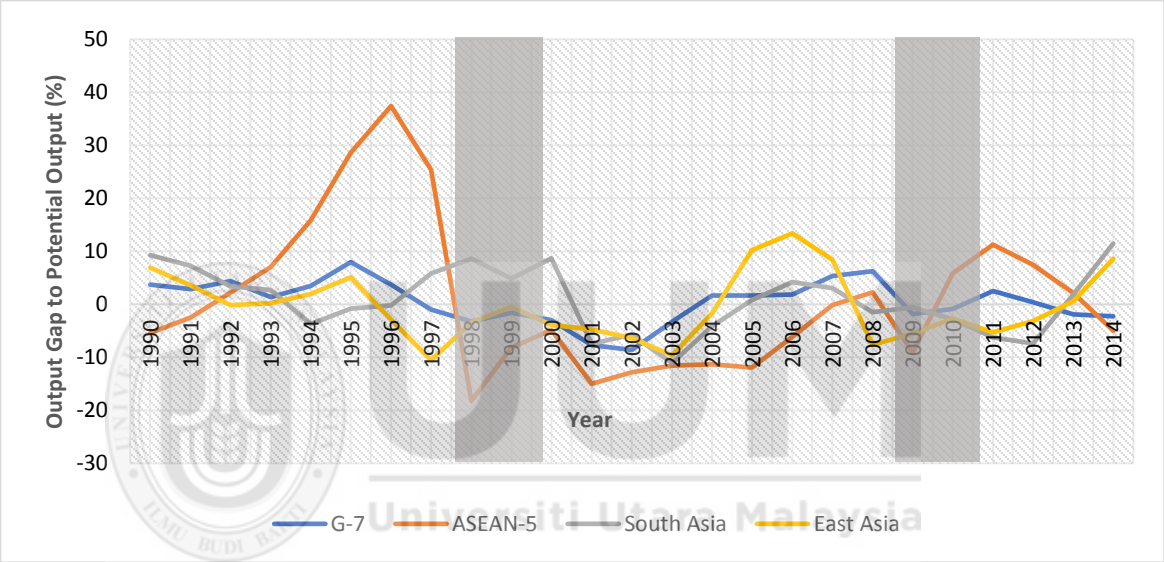

Figure 1.1
Output Gap to Potential Output in the ASEAN-5, G-7, East Asia and Central Asia, 1990-2014
Note: a) The cyclical trends are estimated by Hodrick – Prescott (HP) filter procedure. Potential output path is reflected by zero horizontal line.
b) The shaded parts show the trend of output gap to potential output during AFC and GFC

Similarly, the region endured a negative and declining of output gap to potential output by 9.1 percent which was larger than other regions during GFC. Unlike AFC, the region managed to contain adverse shock by immediately returns to potential output. Hence, it became resilient. Shortly after the recovery, the region posed a downward output gap from potential output trend. It was because the post – GFC period (2011 – 2015) demonstrated

increasingly global economy risks such as the economic slowdown in major industrial country and the falling of commodity price. These causes have contributed to the sluggishness of export growth and investment level, decreased aggregate below than potential output and undermined the resiliency of ASEAN – 5 region (ADB, 2015).

1.1.3 The Effects Fiscal Policy on Economic Resilience

Fiscal policy plays an important role as shock – absorber that leads an economy to be resilient at potential output. From Keynesian point of view, a government utilizes its expenditure or taxation to absorb adverse shocks by influencing AD components such as consumption, investment and net export during shock and brings aggregate output to potential output (pre – existing economic path). Hence, it causes an economy to become resilient (Aiginger, 2009; Abdon, Estrada, Lee & Park, 2014).

For instance, the effect of adverse shock during recession such as the declining of aggregate output and unemployment effect can be absorbed through a high government expenditure and low tax rate. It increases AD and aggregate output. As a result, it induces aggregate output to potential output during economic recessions. In contrast, a low government spending and high taxation rate buffer against the excessive spending during economic booming. It helps to cooldown inflationary pressure by reducing aggregate output to potential output (Fatás & Mihov, 2012; Mankiw, 2015).

Furthermore, it is necessary for a country to have surplus or balance in fiscal position. This healthy fiscal position would allow the adjustment of government expenditure and taxation easily in facing economy shock. In this regard, fiscal balance to GDP ratio reflects the ability of policymaker to deliver pro – active government spending and taxation for offsetting economic shock which leads to achieve economic resilience (Bhaskaran, 2007; Briguglio et al., 2009; Aiginger, 2009). Figure 1.2 exhibits fiscal balance of the ASEAN – 5 countries for last two decades.

As shown in Figure 1.2, fiscal position to GDP ratio of the ASEAN-5 countries was recorded to be surplus or at balance position before AFC (1992 – 1997). It was corresponding with economic booming and strong economic activity that contributed to the increasing of government revenue. In this period, a prudent fiscal policy (government spending is made within revenue) has been set by Singapore, Malaysia, Thailand and Indonesia. Due to the fiscal surplus to GDP ratio position, it indicates that the countries can deliver a fiscal expansionary to absorb adverse economic shocks. In contrast, fiscal deficit has been a problem in the Philippines due the weakness of tax collection such as inadequate tax effort and low tax compliance. It constrained fiscal policy to absorb economic shock and become resilient (ADB, 1997).

The onset of AFC has caused the weakened of corporate and banking sector with a high level of non – performing loans (NPL) to total loan about 35 percent and resulted a further contraction in investment level (ADB, 1999). The ASEAN – 5 countries have imposed fiscal expansionary on their economy to promote economic resilience by stimulating

consumption and investment and, aggregate output thereby, recapture to potential output (pre – shock level) in the business cycle. Fiscal expansionary included government expenditure on poverty eradication program, social security (welfare program that protect low income group from the adverse shocks such as unemployment benefits, food stamp and cash transfer), infrastructure, education and housing as well as tax reduction of income tax corporate income tax rebate and tax exemption (The World Bank, 1999; Tan, 1999).

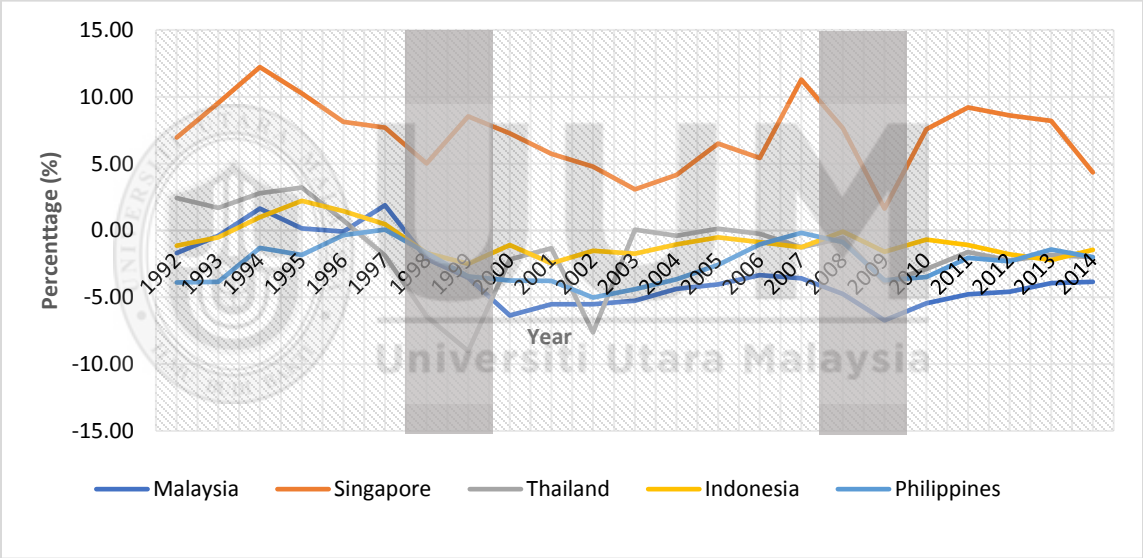

Figure 1.2
Fiscal Balance to GDP in ASEAN-5 Countries, 1992-2014
Source: ADB, 2015
Note: The shaded parts show the trend of fiscal balance to GDP during AFC and GFC

Due to the fiscal expansionary, fiscal balance to GDP ratio during AFC shown in Figure 1.2 has slightly declined to deficit position in Thailand (9.1 percent), Indonesia (2.5 percent), the Philippines (3.4 percent) and Malaysia (3.5 percent) whereas, fiscal balance to GDP ratio of Singapore was still surplus but it dropped to 5.1 percent in 1999. The

effect of fiscal expansionary on the stability of the ASEAN – 5 countries is exhibited in Figure 1.3.

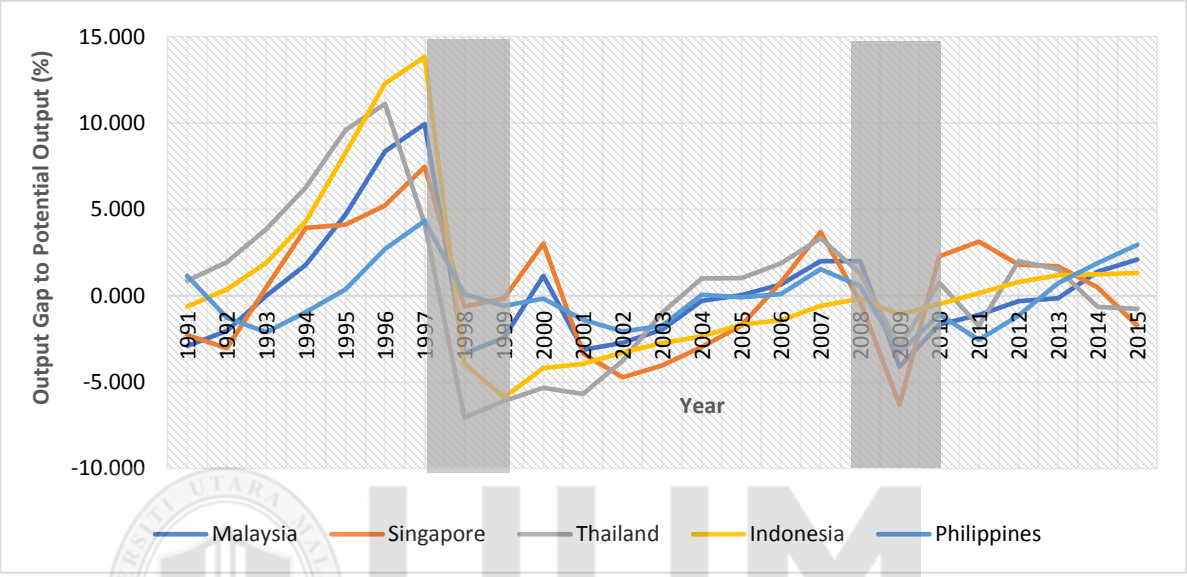

Figure 1.3
Output Gap to Potential Output (%) in ASEAN – 5 countries, 1991-2015
Note: a) The cyclical trends are estimated by Hodrick – Prescott (HP) filter procedure. Potential output path is reflected by zero horizontal line.
b) The shaded parts show the trend of output gap to potential output during AFC and GFC

In Figure 1.3, after AFC, negative output gap to potential output ratio has been decreased in Malaysia (1.1 percent), Singapore (3.0 percent), and the Philippines (0.2 percent) in 2000. It implies that the countries have returned to the potential output and become resilient. In contrast, negative output gap to potential output was persistent in Indonesia (4.2 percent) and Thailand (5.3 percent) after AFC due to a persistent investment

contraction[3]. It implies that the countries were unable to recapture the potential output and become less resilient (ADB, 2001).

During the post – AFC period (2001 – 2005), the uncertainties of global political condition has short – lived the resiliency of the ASEAN – 5 economies at potential output. It undermined investment climate and decreased investment and export growth (ADB, 2003). It diverged and prolonged aggregate output from potential output. For instance, negative output gap to potential output has been increased in Singapore (4.7 percent), Indonesia (2.7 percent), Malaysia (2.0 percent), Thailand (3.2 percent) and the Philippines (1.7 percent) in 2002.

In order to stabilize aggregate output to potential output, some of the ASEAN – 5 countries such as Singapore, Thailand, Malaysia, and the Philippines maintained their fiscal expansionary stance by increasing government expenditure and reducing income tax. It aimed to prevent recession and to keep unemployment rate down (ADB, 2003). In contrast, Indonesia was tied with servicing public debt commitment that would increase fiscal deficit to GDP ratio overtime. Therefore, the country took a tightened fiscal stance in order to reduce deficit in fiscal position by lowering spending on fuel subsidy and suspending expenditure on development (ADB, 2004). Hence, it delayed the country to become resilient at potential output.

[3] Inadequate progress in financial market restructuring, high corruption level and political instability has discouraged investment in Indonesia and steep rise of oil price and US economic slowdown has contributed to the declining of export, decelerated in manufacturing growth and exacerbate the declining of investment level in Thailand (ADO, 2001).

Due to the fiscal expansionary stance, Figure 1.2 shows that fiscal balance to GDP ratio of the ASEAN – 5 countries have been in deficit position, except in Singapore after AFC. Therefore, it can impede the countries to deliver fiscal policy during shocks. Some the ASEAN – 5 countries took a measure to reduce fiscal deficit. For example, Thailand improved tax administration and collection in order to increase government revenue and reduce its fiscal deficit. Meanwhile, the Philippines strengthened fiscal balance by broadening tax bases and tax collection in order to increase government revenue (ADB, 2003).

Meanwhile, GFC has increased negative output gap to potential output of the ASEAN –5 countries. As a response, the countries set a fiscal expansionary by increasing government expenditure on education, health, infrastructure, transportation, social security and subsidy to boost AD and aggregate output (ADB, 2009; Jha, Mallick, Park & Quising, 2014). Corresponding with the fiscal expansionary measure, a quick economic stability at potential output has been achieve by the ASEAN – 5 countries, implying that they were resilient to GFC. As shown in Figure 1.3, a positive output gap to potential output has been achieved in Thailand (0.8 percent) and Singapore (2.3 percent) whereas, the negative output gap to potential output has been decreased in Malaysia (1.6 percent), Indonesia (0.4 percent), and the Philippines (1.1 percent).

Figure 1.3 also shows the Philippines, Malaysia and Indonesia continued to have a positive output gap to potential output at post – GFC period. It was mainly supported by a robust domestic demand such as private consumption. These countries began to reduce

fiscal deficit to GDP by tightening their fiscal policy. For instance, Malaysia and Indonesia have a continuously reduced subsidy on fuel, gasoline and cooking oil and redirected government spending on cash transfer, infrastructure and incentives for business expansion to support consumption and investment level (ADB, 2015, 2016). Consequently, the trend of fiscal deficit to GDP ratios of Malaysia, Indonesia and the Philippines in Figure 1.2 decreased from 2010 to 2014.

Based on Figure 1.2 and Figure 1.3, the response fiscal policy on output gap for each ASEAN – 5 countries can be deduced in scatter plot in Figure 1.4 – Figure 1.8.

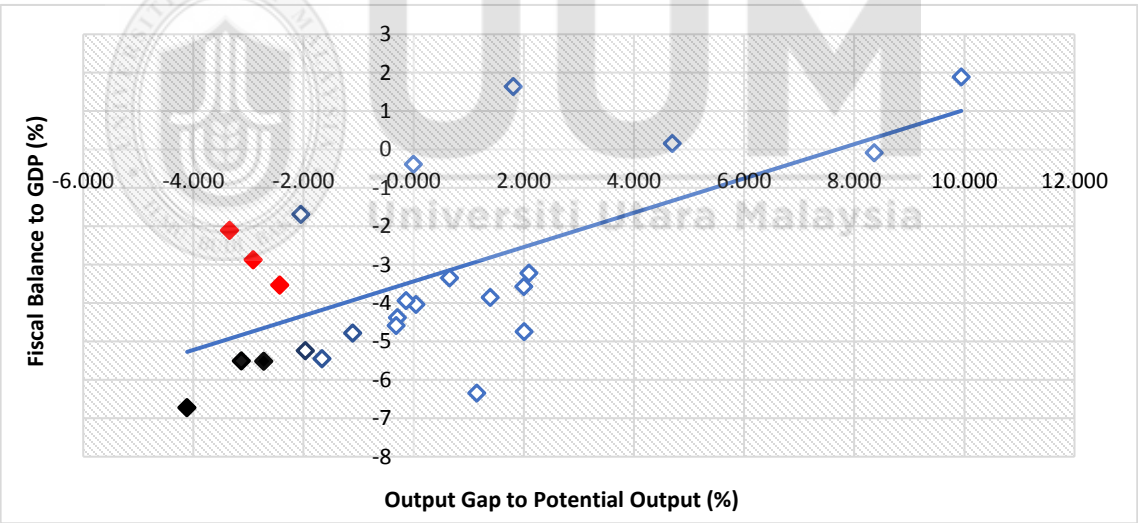

Figure 1.4
Fiscal to GDP response (%) to Output Gap to Potential Output (%) in Malaysia
Note: Red dot indicates AFC period (1998 – 2000) and black dot indicates GFC period (2008 – 2010)

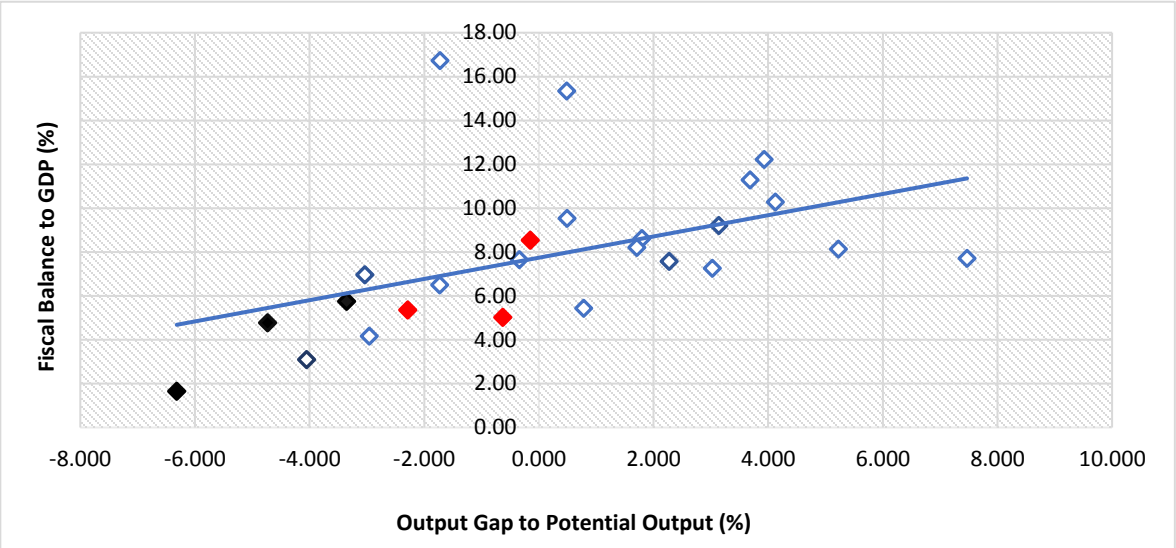

Figure 1.5

Fiscal to GDP response (%) to Output Gap to Potential Output (%) in Singapore

Note: Red dot indicates AFC period (1998 – 2000) and black dot indicates GFC period (2008 – 2010)

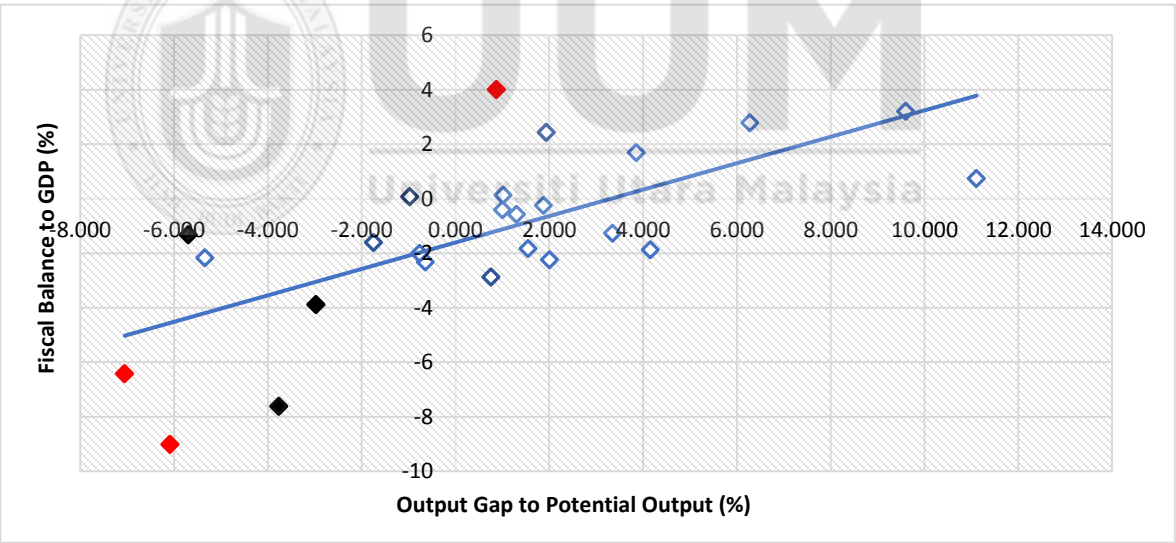

Figure 1.6

Fiscal to GDP response (%) to Output Gap to Potential Output (%) in Thailand

Note: Red dot indicates AFC period (1998 – 2000) and black dot indicates GFC period (2008 – 2010)

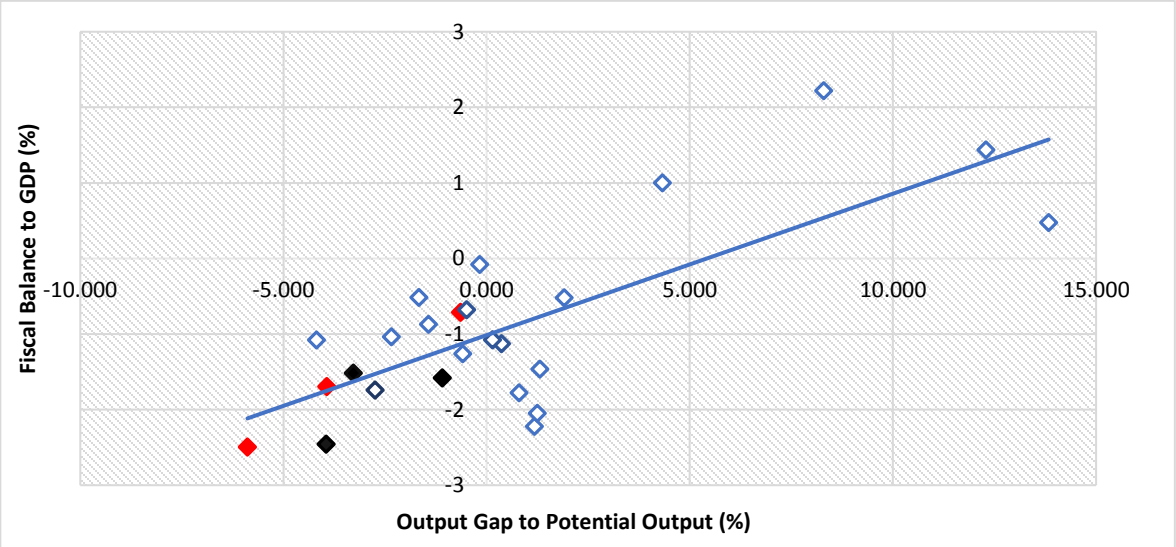

Figure 1.7

Fiscal to GDP response (%) to Output Gap to Potential Output (%) in Indonesia

Note: Red dot indicates AFC period (1998 – 2000) and black dot indicates GFC period (2008 – 2010)

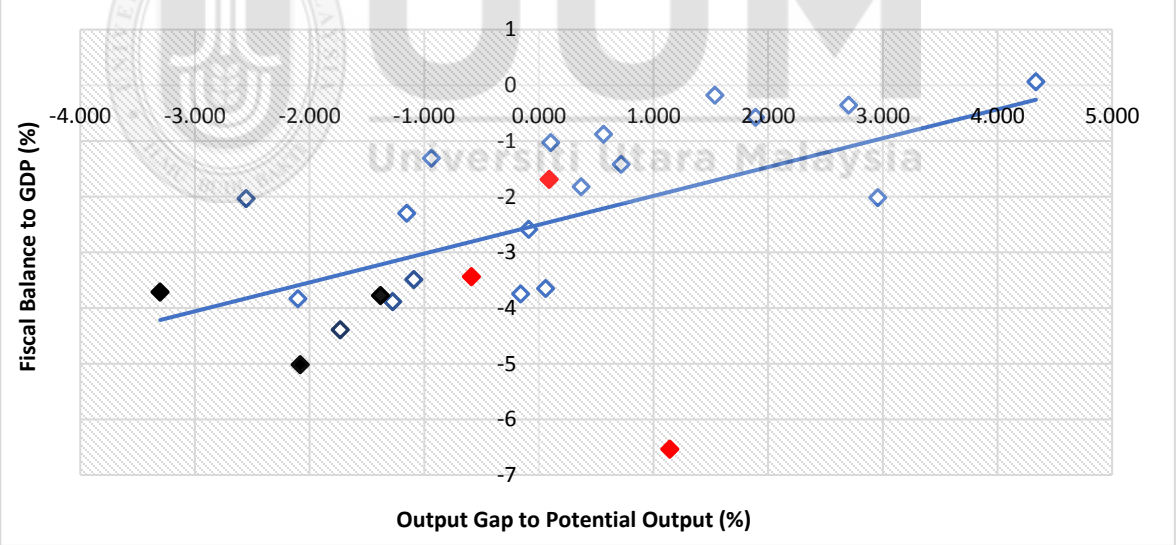

Figure 1.8

Fiscal to GDP response (%) to Output Gap to Potential Output (%) in the Philippines

Note: Red dot indicates AFC period (1998 – 2000) and black dot indicates GFC period (2008 – 2010)

Based on scatter plot in Figure 1.4 – Figure 1.8, linear relationships between fiscal to GDP and output gap to potential output can be formed which are represented by straight lines. The straight lines are portrayed to be upward sloping. It signifies that fiscal balance to GDP decreases due to the increasing of fiscal expansionary utilization as output gap to potential output is declining. It indicates that fiscal policy is reacted on output gap in a countercycle way for all the ASEAN – 5 countries.

1.1.4 The Effectiveness of Fiscal Policy on Economic Resilience

The effectiveness of fiscal policy on economic resilience is closely related with fiscal multiplier effect. The effect pertain to which extent fiscal policy stimulates aggregate output which it can brings back aggregate output to potential output after shock (Mankiw, 2003; McConnell, Bruce & Flynn, 2009). In the ASEAN – 5 countries, there are some issues that associates with fiscal multiplier effect on output which in turn, influences fiscal effectiveness on economic resilience. The issues consist of economic openness, financial development, political factor and public debt which are depicted in Figure 1.9.

In an open economy, it is argued that a fiscal expansionary (government expenditure increases and tax rates decreases) not only increases household consumption but, also increases import demand. Therefore, the effect of fiscal expansionary on output will leak out through import demand and offset the increasing of aggregate output. It will reduce multiplier effect and the effectiveness of fiscal policy to increase aggregate output to potential output (OECD, 2010; Barrell, Holland & Hurst, 2012; Batini, 2014).

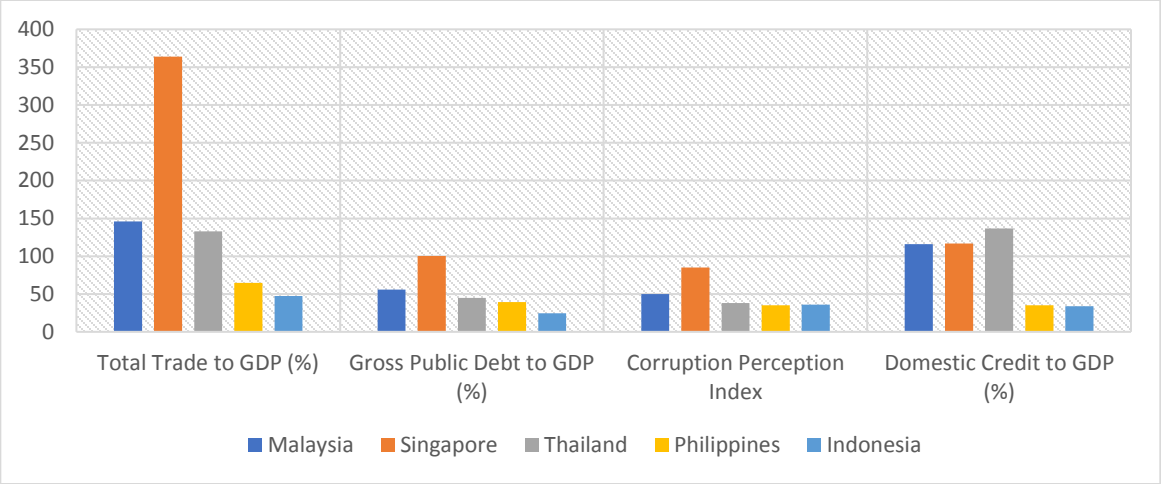

Figure 1.9:
The Average of Total Trade to GDP (%), Gross Public Debt to GDP (%), Domestic Credit to GDP (%) and Corruption Perception Index (CPI) in ASEAN – 5 Countries, 2010 – 2015.
Source: WEO, 2015 The World Bank, 2015 and Transparency International, 2015
Note: The CPI score greater than 50 means perceived corruption level is low. CPI score less than 50 means perceived corruption level is high.

Table 1.9 shows the degree of economic openness in the ASEAN – countries which is measured by the percentage of total trade (export and import) to GDP ratio. Fiscal policy of Malaysia, Singapore and Thailand would be less effective to promote economic resilience due to their high degree of economic openness. It causes AD to leak through import, decreases aggregate output and prevents aggregate output to be at potential output. In contrast, fiscal policy of Indonesia and the Philippines can be effective to promote economic resilience due to their low degree of economic openness.

Public debt is also a factor that influences the effectiveness of fiscal policy on economy resilience. A high public debt will be translated into high principle amount and interest payment. It induces future tax rate to rise in the future. Rather than using tax revenue for

fiscal expansionary purpose, the revenue will be channelled to pay public debt (Hur et al., 2010; Loganathan et al., 2011; Siew-Peng & Yan-Ling, 2015). Therefore, it will undermine the ability of fiscal policy to promote economic resilience. Figure 1.4 indicates that public debt to GDP ratios of Singapore and Malaysia were the highest. These debts will be a burden for these countries to have fiscal surplus that can be utilized to counteract shocks. On the other hand, public debt to GDP ratios for Thailand, the Philippines and Indonesia are much lower which it enhances the ability of fiscal policy in these countries to promote economic resilience.

In other issues, financial development enhances the effectiveness of fiscal policy on economic resilience. Financial development represents the easiness of domestic economic sectors to be financed by financial institutions. A high financial development smooth government expenditure by providing a better credit access to government that overcomes government's financial constraint during economic shocks. Financial development is measured by percentage of total domestic credit to GDP ratio (Debrun, Pisani – Ferry & Sapir, 2008). Figure 1.9 shows that total domestic credit to GDP ratios of Malaysia, Thailand and Singapore are high which implies that financial sector in these countries was highly developed. By means of the highly developed financial sector, government of these countries have an easy access to credit for financing government expenditure during economic shock. In contrast, there is lack of financial development in Indonesia and the Philippines due to low level total domestic credit to GDP ratios of these countries. The government of these countries would be facing financial constraints due to lack of credit access for financing government expenditure during economic shock.

From political aspect, the abuses of power and high corruption level can undermine the effectiveness of fiscal policy on economic resilience. These factors are manifested by multiple interest groups who are seeking to secure a greater share of national wealth which is causing a large public expenditure on their behalf. Thus, they tend to create an excessive government spending as government revenue is increasing during economic booming which in turn, constrain government expenditure during economic recession (Talvi & Végh, 2005). This scenario causes fiscal policy to be less effective to stabilize economy. As described in Figure 1.9, corruption perception indices of the Philippines, Indonesia and Thailand are low which indicate that the abuses of power and corruption level are serious problem in these countries. The effectiveness fiscal policy will be severely limited due to the high corruption level of these countries.

Also, monetary policy influences the effectiveness of fiscal policy on economic resilience. A low interest rate set by central bank promotes investment level and aggregate output by reducing cost of borrowing. Thereby, it will help fiscal policy to boost aggregate output in an economy toward potential output (Erceg & Lindé, 2010; Woodford, 2010). Figure 1.10 exhibits the trends of interest rate of the ASEAN – 5 countries.

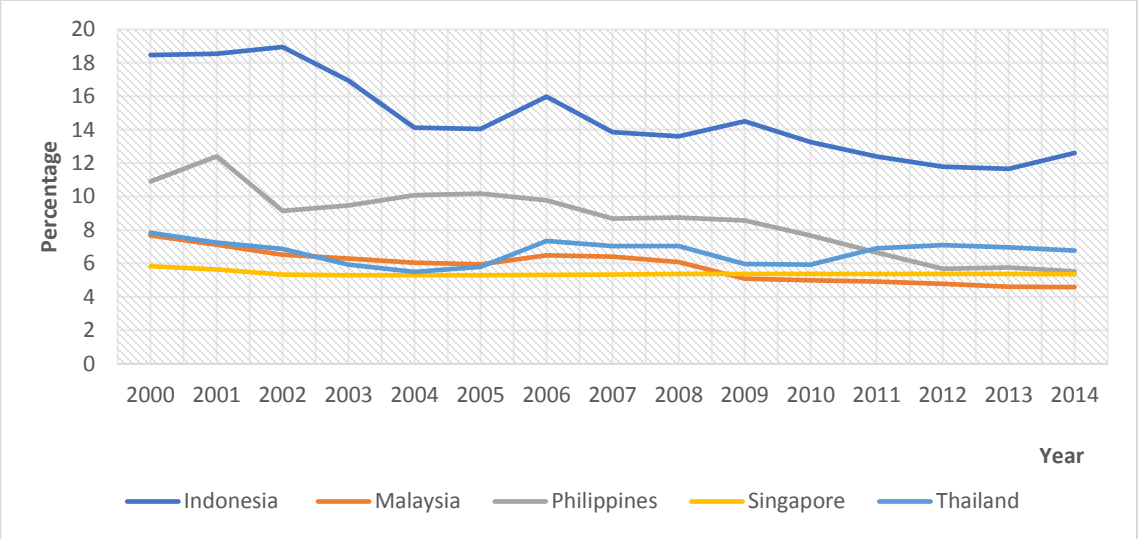

Figure 1.10
Lending Rate in ASEAN – 5 Countries, 2000 – 2015
Source: The World Bank, 2015

In Figure 1.10, lending rate is a short – term interest rate that is set by central bank on loans. Interest rates of Malaysia, the Philippines, Singapore and Thailand stay at low level which are below than 10 percent. These interest rates imply that the cost of borrowing is low. They would encourage capital accumulation and investment level in these countries which in turn, help fiscal policy to boost aggregate output during economic shock. In contrast, interest rate in Indonesia is much higher and above than 10 percent. It implies that the cost of borrowing is expensive which it can discourage investment level. Thus, it offsets the effect of fiscal policy on aggregate output and reduces fiscal effectiveness on economic resilience.

1.2 Problem Statement

The ASEAN – 5 countries suffer from a high economic instability due to external shocks. As seen in Figure 1.1, it appears that the ASEAN – 5 countries have experienced a higher and prolonged output gap to potential output compared to other regions since last two decades. Although most of the ASEAN – 5 countries managed to return back to their pre – growth rate after GFC and became resilient (as shown in Table 1.3), a high economic instability can reduce their average growth rate from pre – shock economic growth rate. Thereby, the economic instability causes the ASEAN – 5 countries to be less resilient. For instance, at post – GFC period, external shocks such as continued economy slowdown in major industrial countries and the falling of commodity price caused a declining of export growth and investment level in the ASEAN – 5 countries. Therefore, they caused a high economy instability (a large and prolong negative output gap) and contributed to a low economic growth. As a result, due to the external shocks, the economic growth of Indonesia, Malaysia, Singapore and Thailand has declined to 4.2 percent, 5.0 percent, 2.0 percent, and 2.8 percent, respectively in 2015 (ADB, 2016). They were below than the benchmark set by OECD (2015) for the ASEAN – 5 countries to be resilient which is 5.5 percent. On the other hand, economic growth of the Philippines also declined to 5.8 percent but was above than 5.5 percent which implies that this country was still resilient.

From macroeconomics perspective, fiscal policy plays an important role as shock – absorber that contains shock and leads a country to achieve pre – shock level and become resilient. However, the ability of fiscal policy in the ASEAN – 5 countries to absorb

shocks have been decreased. For instance, due to undertaken fiscal expansionary during GFC, fiscal deficit to GDP ratios of ASEAN – 5 countries have been increased and became persistent, except in Singapore (Figure 1.3). These fiscal deficits to GDP ratios would reduce the ability of the ASEAN – 5 countries in delivering fiscal tools to absorb persistent external shocks after GFC which in turn, prevent the countries to be resilient (ADB, 2014). Thus, fiscal tool cannot play role as shock absorber in promoting economic resilience. At this point, there were inconclusive findings on the role of fiscal policy as shock – absorber in developing countries, which also reflected the ASEAN – 5 countries. It found that fiscal policy can play shock – absorber role where it dampens output fluctuation to potential output in developing countries by Calderón and Schmidt – Hebbel (2008), Bogdanov (2010), Debrun and Kapoor (2010) and International Monetary Fund (IMF) (2015). In contrast, Hakura (2007), Andersen and Lasse (2010) and Frankel, Vegh and Vuletin (2013) found that fiscal policy plays shock – inducer role that exacerbates output fluctuation from potential output.

Fiscal policy is appeared to be less effective to promote economic resilience in the ASEAN – 5 countries. For instance, Figure 1.3 shows that the ASEAN – 5 countries did not return quickly to their potential output after AFC, despite the countries adopted fiscal expansionary to boost aggregate output during the period. There are issues that associates with the effectiveness of fiscal policy on economic resilience in the ASEAN – 5 countries. For instances, economic openness has been addressed to influence the effectiveness of fiscal policy to stabilize the ASEAN – 5 economies at potential output during economic shocks. In Figure 1.4, due to a high degree of economic openness in Malaysia, Singapore

and Thailand, the positive effect of fiscal on AD and output will be leaked out through import demand (Rafiq, 2013; Tang, Liu & Cheung, 2013; Kawai & Zhai, 2010).

On the other hand, government debt also has been highlighted to influence the effectiveness of fiscal policy to stabilize in Malaysia and Singapore (Nina & Anita, 2010; Doraisami, 2011; Kawai & Morgan, 2013; Rajan, Tan & Tan, 2015). A high government debt is translated into high tax rate and contraction of government spending in the future. It decreases AD and output in the future and offsets the impact of fiscal stabilization. In political aspect, Figure 1.4 shows a high corruption level in Indonesia, the Philippines and Thailand would increase the uncertainty of government spending during economic shock. Figure 1.4 also shows that financial development is low in the Philippines and Indonesia. It causes the countries face a financial constraint during economic shock (Debrun & Kapoor, 2012; Édes & Morgan, 2014). In other issues, as shown in Figure 1.5, the interest rate of Indonesia is the highest in the ASEAN – 5 countries. It decreases investment level and aggregate output. It offsets the effect of fiscal expansionary to boost aggregate output and reduces the effectiveness of fiscal policy on economic resilience.

1.3 Research Question

In view of the problem statement above, this research would answer the following questions:

i. How resilient the ASEAN – 5 countries are?

ii. Does fiscal policy play a significant role as shock – absorber the ASEAN – 5 countries?

iii. How effective the fiscal policy to influence economic resilience in the ASEAN – 5 countries?

1.4 Research Objective

The general objective of this study is to investigate economic resilience from economic stability perspective and the role of fiscal policy on economic resilience in the ASEAN-5 countries. The specific objectives are:

i. to determine the impact of shocks on economic resilience of the ASEAN – 5 countries

ii. to investigate the effect of fiscal policy on economic resilience in the ASEAN – 5 countries

iii. to examine the effectiveness of fiscal policy on economic resilience in the ASEAN – 5 countries.

1.5 Significant of the Study

Promoting economic stability is important for an economy to contain economic crisis and avoid large swing in economic activity, high inflation and unemployment rate, excessive volatility in foreign exchange and financial markets which in turn, enhances resiliency to shock. Instability can increase uncertainty and risk, discourage investment, impede

economic growth and undermine living standard. As a dynamic economy, it is necessarily for the ASEAN – 5 countries embrace with some degree of volatility such as highly integrated with global market to promote a higher economic growth. Thereby, it is a challenging issue for policymakers to minimize instability of economy in order to be resilient while, maintaining economic growth momentum, productivity and employment.

In this regard, external factors have a greatly implication to the ASEAN – 5 economic stability as the region seems to capture about 24 percent of global trade (Woetzel, Tonby, Thompson, Burtt & Lee, 2014). It makes these countries are being exposed to variety of external shocks such as financial crisis, sovereign debt crisis and commodity price fluctuations in global economic. These shocks will increase risk and uncertainty for household, investors businesses, and government and when large sufficiently, they can trigger an economic crisis by throwing off the economy from the growth path. To return back to the economic growth path, it is depending on the degree of resiliency to economic shocks. In this respect, this study attempts to explore economic resilience from economic stability perspective based on Keynesian theory. It pertains two dimensions which are shock amplification that widened output fluctuation in business cycle and, shock persistent that prolonged output fluctuations (Duval et al., 2007). The finding of this study will provide insights about the stability of economy in dealing with economic shocks which leads a better understanding of economic resilience in the ASEAN – 5 countries.

Furthermore, fiscal policy plays a key role to promote economic resilience in the ASEAN–5 countries. Through government expenditure and taxation measures, it enables

economy to absorb economic shock by dampening and shortening output fluctuation to equilibrium path at potential output. For instance, fiscal expansionary is needed to absorb unemployment effect and income losses during economic recession. It promotes consumption, investment and AD which in turn, boosting aggregate output to potential output. In this regard, this study demonstrates the usefulness of fiscal policy to promote economic resilience in the ASEAN – 5 countries. Based on inconclusive finding of the previous literatures, this study intents to contribute to the existing body of knowledge by examining and revisiting empirically the effect of fiscal policy on output fluctuation. The link between fiscal policy and output fluctuation that is explored in this study would enable to shed light on the role of fiscal policy to absorb economic shocks.

1.6 Scope of the Study

This study focuses the impact of fiscal tools on economic resilience from economic stability perspective and the fiscal tools effectiveness on economy resilience in the ASEAN – 5 countries. The ASEAN – 5 countries sample provide an interesting insight about economic resilience. As fast – growing consumer markets and competitive countries, these countries have attracted a huge amount FDI from other region which was larger than China (Vinayak, Thompson and Tonby, 2014). Moreover, the ASEAN – 5 is also a major global hub of manufacturing and trade in the world where it is considered as fourth the largest exporting region in the world. This makes the ASEAN – 5 countries to be highly sensitive to external shock compared to other Asian regions. AFC and GFC have been hardly affected these countries which each the ASEAN – 5 countries recovers

to pre – shock level at different pace (Briguglio & Piccinino, 2012). It indicates that each ASEAN – 5 countries has different the degree of resiliency to external shock.

This study covers annually data for 1981 – 2014 period. During this period, the ASEAN –5 economies was hardly affected by Commodity Crisis in early of 1980s, AFC in 1997 and GFC in 2008. Therefore, by considering this period, this study can measure the resiliency of the ASEAN – 5 countries to the external shocks. This study employs panel data analysis to examine the relationship between output fluctuations and fiscal tool variables as well as other variables such as shock persistent, monetary policy, financial development and trade openness. The analysis in this study uses econometrics techniques such as Seemingly Unrelated Regression (SUR), Fully Modified Ordinary Least Square (FMOLS), Autoregressive Distributed Lag (ARDL), Vector Autoregressive (VAR) and Impulse Response Function estimation.

1.7 Organization of the Study

This study consists of five chapters including Chapter One. Meanwhile, Chapter Two reviews the relevant of theoretical and empirical study concerning economic resilience and economic stability and fiscal stabilization. Research methodology is discussed in Chapter Three. Chapter Four presents the result of analysis and discussion upon the result of analysis. Finally, the conclusion of the study and policy implication are discussed in Chapter Five

CHAPTER 2

LITERATURE REVIEW

2.1 Introduction

This chapter contains six main sections including the introductory section. In Section 2.2, the theories and concepts of economic resilience are systematically discussed. Section 2.3 discusses the role of fiscal policy on economic resilience. Meanwhile, Section 2.4 reviews empirical works on economic resilience while, Section 2.5 reviews the empirical works that are related with the role of fiscal policy on resilience. In addition, Section 2.6 identifies the existing gaps in this review. Finally, Section 2.7 concludes the discussion in this chapter.

2.2 Theory of Economic Resilience

The term of resilience is originated from Latin root "resilire" which means to leap back or to rebound back (Simmie & Martin, 2009). The term resilience has been adopted in several fields. Notably in psychology field, American Psychological Associations (2006) defined resilience as a process of adapting to be well in the face of adversity, trauma, tragedy, threat or significant of stress. On other hand, in the field of ecological, resilience refers to vulnerability to surprises and shocks. In this sense, high resilience is associated with low vulnerability, a condition that is greatest when a system is at high state of reorganization, growth and innovation (Foster, 2008). Meanwhile, resilience in the field

of archaeology is associated with the patterns of human extraction upon resources and the impact of those human activities on the continuing condition of ecosystem and environment (Redman, 2005). In physic, resilience is the ability of an elastic material such as rubber or animal tissue to absorb energy from a pressure and release the energy back as it springs back to its original shape (Merriam – Webster Dictionary, 2014).

However, in the field of economy, there is no universally agreed definition on the concept of economic resilience (Simmie & Martin, 2009). There were ambiguities that are surrounding the concept economic resilience. The recent researches have put the ideas of resilience on economy study in various ways. For instances, Holling (1973) and Pimm (1984) popularized engineering economic resilience (EER) which was adopted from the field of physic. They defined EER as the stability of an economy system to be near equilibriums or steady states against shock. In the definition, the stability of economy system is explained by the resistance to disturbance and speed to return to pre – existing equilibrium.

Meanwhile, Briguglio et al. (2009) perceived economic resilience as the ability of an economy to cope with shocks. On the other hand, Foster (2006) described economic resilience as an ability to assess vulnerabilities in an economy, capability to response to anticipate shock (such as planning on repairing infrastructure, filling, alleviating identified weakness and vulnerabilities, building strength and assets, and building effective networks and connections) and ability to recover from shock in term of fixing system damaged and quickly returning to expected level of regional functioning.

Furthermore, Rose (2009) classified economic resilience into static and dynamic resilience. Static resilience is defined as the ability of an economic system to continue functioning (continue producing output) when shocks occur whereas, dynamic economic resilience refers to the speed of a system to recover from shock at desired state. Also, Hallegatte (2014) argued that regional resilience refers to the duration of reconstructing process after shock that is including the capacity of sectors to deliver construction process, mobility of resources for economic reconstructing, openness of economy and ability to access resources, and; financial accessibility of private sector, household and firms.

In addition, Simmie and Martin (2009), Dawley, Pike and Tomaney (2010) Trembaczowski (2012) and Wink (2012) defined economic resilience as an adaptive capacity response. It pertains the capacity of an economic system to adapt a new environment such as technological, labor force and institutional structure changes thereby, creating a flexible and creative response to shock. This capacity is built based upon knowledge – based local economy that promotes innovative firm, the skills of workers and the empowerment of institutional forms that learn and change their behaviour to adapt with shock. For example, an innovative institutional and the new form of leadership shape a new strategic thinking on decision making and serve to reinvent and reposition the notion of local development policies and practices to adapt to the shocks.

2.2.1 Engineering Economic Resilience

Among these definitions, the most popular theory of resilience is engineering economic resilience (EER). It pertains the stability of an economy to be around equilibrium and steady state. In this sense, shocks may deviate an economy from its trajectory. However, the economy will be adjusted back to its underlying trajectory via policy setting formulated by local institutions (Simmie & Martin, 2009; Drobniak, 2012).

In this definition, the trajectory is assumed to be an equilibrium state where a regional economy would maintain at the trajectory when shock is absent. The trajectory is related with the structure of relationship among macroeconomic variables that persists over a long period of time. For example, the social structure[4] and social institutions that are persist for a long period of times will create conditions for long term economic growth (Hill, Wial & Wolman, 2008). Similarly, Martin and Sunley (2006) and Dawley et al. (2010) argued that economic trajectory relates to path dependence notion. The path dependence pertains a region that becomes continually "locked into" a particular structures and development pathway through the operation of self – reinforcing mechanism.

EER conceptualized economic resilience by looking the potential of recovery from shocks either a region is thrown from its growth path and can return to its growth path or not. For

[4] Interrelatedness of production component (such as firms, machines, plants, raw materials, transport networks, labor skills, business organizations, institutional form and so forth) tend to self-reinforce particular economic structure, pattern of technological change, work practices and form of business arrangement that is inherent from past

instances, a regional economy can be thrown off from its path through economic shock such as financial crisis, the collapse of export growth and commodity, oil price shock, natural disasters and political instability. In this respect, Hill et al. (2008) argued that regional economic resilience and non – regional economic resilience can be categorized into three states namely, economically resilience, shock – resistant and non – resilience. The economically resilience refers to regions that can return or exceed their growth path after shock. Meanwhile, the shock – resistant refers to regions that are not thrown off from their growth path during shocks. In contrast, non – resilience is regions that are unable to return to their growth path after shock.

2.2.2 Economic Stability and Engineering Economic Resilience

Based on EER definition, economic resilience can be pronounced into economic stability perspective. Economic stability refers to an absence of excessive fluctuation in the macroeconomy indicator. It is considered economically stable when the economy is having a fairly constant output growth and, low and stable inflation and employment rate. In this regard, economic instability describes the deviation of economy from the pre – existing condition (which is assumed to equilibrium level). Therefore, a high economic instability means that shocks greatly thrown off the economy from equilibrium and causes the economy to be less resilient. This economic stability concept is consistent with EER theory.

From Keynesian perspective, the phenomena of economic instability or economic deviation from equilibrium due to shock can be explained by output fluctuation around natural rate in business cycle. Based on this perspective, there are two components that explain economic deviation from equilibrium namely, natural rate and output fluctuations. According to Okun' Law, the natural rate is long – run level of production goods and services when labor, capital and available technology are at full employment level in an economy (Cottrell, 1984; Blinder, 2002; Owyang & Sekhposyan, 2012). It is also known as potential output or long run aggregate supply (LRAS). To this point, the natural rate reflects a stable trajectory in economy, as stated in EER definition. Therefore, it is assumed to be an equilibrium path in economy in long – run (Mullineux & Dickinson; 1992; Mankiw, 2003; Dutt, 2006; Bjørnland, Leitemo & Maih, 2010).

Meanwhile, output fluctuation is typically caused by demand – side shocks that temporarily moves an economy away from natural rate level whereas, the supply – side factors such as capital stock, labor force and technology are assumed to be independent to output fluctuation and only determine the level of natural rate (Cottrell, 1984; Shapiro & Watson, 1988; Galí, 1994; Blinder, 2002). In this respect, output fluctuation consists of two phases namely, expansion and contraction. The expansion phase demonstrates the excessive AD that causing aggregate output to increase higher than potential output which is accompanied by a high inflationary pressure. The contraction phases reflect the inadequate of AD in economy that makes output decreasing and deviates below than potential output and leads to a high unemployment rate (Mankiw, 2003; Owyang & Sekhposyan, 2012).

To this point, output fluctuation that reflects the deviation of output from equilibrium can be explained by interactions between AD and aggregate supply (AS) in the short run. Dutt and Skott (1996) have explained the occurrence of output fluctuation under Neoclassical – synthesis Keynesian model. In this model, suppose an economic shock erodes the consumer confidence and reduces consumption and investment which in turn, causing the falling of AD, output, employment, price and wage levels. Therefore, it would throw off the aggregate output from the potential output and causes economic instability.

The output fluctuation which in turn, will be cleared out through price and wage mechanism. Under this mechanism, Mankiw (2003) and Dutt (2006) argued that the presence of price and wage rigidity are resulting the output divergent from potential output to be persistent. The falling of price level will cause firms and households to revise their current price to expectation price level. Thus, workers need more time to bargain for new nominal wage level and, firms to change their good and services price level to actual price that causes a prolonged of output divergence in short run. In the long run, the actual price and wage levels meets the expectation levels. The reduction in labour cost encourages firms the expands their employment and production. It will increase AS and induce aggregate output toward equilibrium at potential output or natural rate.

Output fluctuations are commonly measured by output gap. Output gap is defined as the differences between aggregate output to potential output. It distinguishes output fluctuations into output upswing and downswing which reflects the asymmetry of

business cycle. A negative output gap pertains aggregate output is below potential output that denotes the economy is experiencing an economic recession whereas, a positive output gap denotes the economy is booming and aggregate output is above potential output (Kaminsky, Reinhart & Végh, 2004; Congdon, 2008; Bogdanov, 2010; Jahan & Mahmud, 2013).

2.2.3 Economic Stability and Economic Resilience

Economic resilience from economic stability perspective can be viewed in two dimensions namely, shock amplification and shock persistent. The shock amplification reflects the size of aggregate output divergence from the equilibrium path (Robelo, 2005). Shocks in the components of AD might deviate and amplify aggregate output from potential output. In this regard, a low resilient economy tends to experience a large output fluctuation (Duval et al. 2007; Sutherland & Hoeller, 2013; Ziemann, 2013). The shock amplification dimension is determined by the size of shock and shock resistance.

The size of shock depends upon the vulnerability of a country to external shock. As argued by Guillaumont (2009), a country that highly rely upon global factors is likely to be highly exposed to external risks such as exchange rate volatility, collapsed export demand and reversal capital inflow. The higher degree of economic openness, the more prone the country to external shocks and the greater impact the external shock to the economy which in turn, contributing to a large output fluctuation.

On the other hand, shock resistance is related with mechanisms that reduce output and employment losses during shock thereby, reducing the size of output divergence (Hill et al. 2008; Briguglio et al. 2009). For instance, diversification in production allows firms to adjust and shift from the most affected production to the least affected production hence, reduce the output and employment losses and minimize output fluctuation (Xiao & Drucker, 2013).

Furthermore, shock persistence dimension pertains the duration of output fluctuation. Fatás (2000) and Duval et al. (2007) argued that a high shock persistent reflects a prolonged output fluctuation in business cycle. It delays aggregate output adjustment toward potential output thereby, resulting the economy to be less resilient. From Keynesian view, shock persistence is determined by the rigidity of wage and price levels. In this view, wage and price levels do not adjust easily or quickly with changes in supply and demand. Thereby, it contributes to the persistency of shocks that is delaying the adjustment of aggerates output and employment toward potential output in the short run (Mankiw, 2015).

In this respect, Duval et al. (2007) and Briguglio and Piccinino (2010) argued that policies or institutions setting causes wage or price stickiness and resulting persistent output reaction to certain shock. For instances, policies that are related to unemployment benefit, stringent employment protection, product market regulation and collective bargaining coverage tend to contribute to the rigidity of wage and price level that will undermine the

incentive to accept employment and preclude work effort. As a result, it can prolong unemployment effect and output downswing in business cycle during economic crisis.

However, as argued by Easterly, Islam and Stiglitz (2000), the price and wage rigidity embedded in Neo – Keynesian theory is not an important factor that explains shock persistent in an economy. The shock persistent was rather than explained by inadequate AD in economy. For instance, Krugman (2010) argued that the long – term unemployment rate in the US after GFC was because of the lack of macroeconomic policy to stimulate AD. Similarly, Park (2010) and Hall (2011, 2015) also argued that a continued unperformed consumption (people tend to save more for precautionary purpose and less spending) and, unperformed investment during economic crisis can hinder and prolong rebalance economic process toward its potential path.

2.2.4 Fiscal Policy and Economic Resilience

Fiscal policy is a macroeconomic policy that utilizes government expenditure and taxation to influence economic activities and national income. In Keynesian theory for instances, the effect of government spending on building infrastructure, transfers, and subsidy will increase household consumption and private investment and eventually, increase aggregate output. Similarly, the reduction of personal and corporate income taxes will render the increasing of household disposable income and firm profit, allow them to make more consumption and investment thereby, increase aggregate output. Therefore, through fiscal expansionary: the increasing of government expenditure and the reduction of tax

rate, it will cause a continuous effect on AD that is resulting a multiply effect on the increasing of aggregate output, particularly, during recession (Mankiw, 2003; McConnell, Brue & Flynn, 2009). This effect is known as multiplier effect. Fiscal policy provides a mechanism for a country to be resilient from shock. As argued by Briguglio *et al*. (2009), policymakers will deliver a sizeable fiscal policy that enable an economy rebounds to equilibrium level after shock. In other words, fiscal policy is utilized to dampen output fluctuation in the business cycle which denotes that the economy is returning back to potential output hence, become resilient from shocks (Duval et al., 2007; Ziemann, 2013).

To be dampen output fluctuation during economic recession, Kaminsky et al. (2004) and Alesina and Tabellini (2005) argued that government will increase its spending and cut tax rates to stimulate private investment, consumption and aggregate output. Therefore, this will induce aggregate output to potential output and reduce output gap. Meanwhile, during economic booming, government will decrease its spending and rise tax rates to reduce private investment and consumption which in turn, reduce output gap. The fiscal response to output is known as countercycle response.

According to Sánchez, Rasmussen and Röhn (2015), the behaviour of fiscal policy to cooldown AD during booming and, to promote AD during recession can be translated into mitigating effect of shock and boost economy recovery to potential output. Based on this argument, the countercycle response of fiscal policy is considered as shock – absorber ability for the fact that the effect of shock is being absorbed by dampening output fluctuations to potential output. In contrast, procycle response is consider as shock –

inducer. It refers to fiscal policy behaviour that amplifies output fluctuation in business cycle (Bogdanov 2010; Debrun & Kapoor, 2010; Sánchez, Rasmussen & Röhn, 2015). There are two fiscal tools that dampen output fluctuation, which are discretionary fiscal policy and automatic stabilizer (Fatás & Mihov, 2012). Discretionary fiscal policy is formulated based on government's decision that subjected to the lags of information, decision and implementation. Legislative, by design institutions, that relies on the consideration of benefits and costs of spending programs and taxations level will find it very difficult to make decision quickly without enough information. Meanwhile, at executive level, public bureaucracies tend to limit capacity of adjusting government expenditure and taxation level quickly with incurring substantial waste (DeLong & Tyson, 2013). Therefore, fiscal discretionary tends to be inefficient where most of time fiscal discretionary is not matching with the optimal size of public sector that is needed to stabilize economy. It can lead to an excessive discretionary spending that will induce a deep countercycle fiscal response that might destabilize and prolong cycle fluctuation (Bogdanov, 2010).

Government expenditure and tax rate that are formulated based on legislative and executive process is considered as discretionary fiscal. Fiscal stimulus is an example of fiscal discretionary fiscal tool (Taylor, 2000; Agnello & Cimadomo, 2009; Dolls, Fuest & Peichl, 2012). During recession, the increasing of government expenditure and reduction of tax rates through legislative process will promote AD, increase aggregate output to potential output, reduce output gap and lead to achieve economic resilience. Fatás and Mihov (2003) argued that this tool is likely to be resulting from political motive

that cause a non – optimal decision of government expenditure and taxation level in economy thereby, giving a less stabilization on economy.

For the measurement of fiscal discretionary tool, Galí and Perotti (2003) argued that fiscal policy can be decomposed into two parts. First, endogenous component reflects fiscal policy that response to cyclical changes. Second, exogenous component pertains fiscal policy that is less responsive to cyclical changes. Irrespectively of variable is used, it is important to distinguish cyclical movement component from fiscal policy variable to reflect discretionary tools. To this point, cyclical adjusted balance (CAB) has been used as discretionary tools measurement. It was defined as what budget balance position would have prevailed if the aggregate output at potential output. This part of budget balance captures fiscal policy that was not influenced by cyclical changes (at least in short run) due its lags in implementation which is consistent with the concept of discretionary fiscal.

Similarly, Blanchard's (1990) argued that endogenous fiscal that react to economic condition is reflected by the response fiscal balance to current economic condition such as unemployment, inflation rate and economic growth then, constructed by using estimated elasticity. The difference between this value and actual fiscal balance is a measurement for discretionary fiscal. Fatás and Mihov (2003) extended the work by using the responsiveness of fiscal balance to GDP growth, inflation, interest rate. The residual from the model represents fiscal discretionary which is orthogonal (statically independent to the state of economy). Thus, it corresponds to the definition of discretionary fiscal.

Meanwhile, automatic stabilizer is a fiscal tool that mitigate aggregate output fluctuations without any explicit government action. Tax rate, transfer and social security spending (sickness and invalidity pension, maternity allowances, unemployment benefits, children's and family allowance, unemployment benefit, retirement and survivor's pension and, death benefits) that embedded in the fiscal budget and less reactive to change with discretionary act of executive are the commonly regarded as automatic stabilizers tools (Fatás & Mihov, 2003; Auerbach & Feenberg, 2000; Duval et al., 2007; Debrun, 2008).

In this respect, McKay and Ries (2013) argued that there are four mechanisms transmission of automatic stabilizer tools. First channel is the disposable income channels which is the most dominant mechanism that presents in the policy discussion of automatic stabilizers. A fiscal instrument such as reducing income tax rate and increasing transfer and social security provide the additional disposable income of household and firms that makes consumption and investment more stable and smooths their income during economic recession (Brown, 1955). The second channel is marginal incentives. For example, with a progressive tax income, it encourages intertemporal substitution of working effort. During economic booming, a rising in income tax rate would reduce worker disposable income thereby, it decreases their work effort and reduces aggregate output to potential output. In contrast, a cut in income tax rate during recession would increase worker disposable income, encourage their work effort, increase aggregate output to potential output (Christiano, 1984). Therefore, it dampens AD shock to its potential output and becomes resilient.

The third channel is redistribution channel. This channel pertains income redistribution through imposing tax on higher income group then, the tax revenue will be distributed to lower income through transfers and social security spending. Blinder (1975) argued that if those who receive funds have more propensity to spend than those who give the funds, consumption and AD will rise with the redistribution. Finally, the fourth channel is social insurance channel. Transfer and social security will act as a large insurance system for society against adverse economic shocks. They can smooth income fluctuation by providing extra financial resources to household and overcoming liquidity constraints during shock. Thereby, they reduce unemployment effect during recession and inflationary pressure during booming and smooth consumption and reduce fluctuation of household income (Floden, 2001; Alonso – Ortiz & Rogerson, 2010)

At macroeconomic level, Rodrick (1998) proposed government size as an automatic stabilizer measurement. Government size reflects to which extent government intervention in an economy through government expenditure and taxation. It is commonly measured by government expenditure to GDP, government revenue to GDP and fiscal balance to GDP ratios. It plays same role as income tax, transfers and social security which is to reduce the risks of adverse shocks. A risky economy condition would choose for a larger government size in order to provide enough insurance against the shock by increasing government expenditure or reducing tax rate in economy thereby, smoothing AD and aggregate output.

2.3 Empirical Review of Economic Resilience and Fiscal Policy

This section explores the previous empirical studies. It consists of three sections. Section 2.3.1 discusses the empirical study on economic resilience. Section 2.3.2 reviews empirical studies that are relating to fiscal policy response on economic resilience. Finally, the issues of fiscal behaviour upon economic resilience in ASEAN – 5 countries are reviewed in Section 2.3.3.

2.3.1 Economic Resilience

At macroeconomic level, the empirical studies of economic resilience were variously explored. The studies generally focused on building the measurement for economic resilience and assessing resiliency of a country or region to shock. For instance, Briguglio et al. (2009) assessed the resiliency of countries based on economic resilience index (ERI) and vulnerability index (VI). ERI measures the capacity of a country to cope with shocks. It is built based on set of economic, social and political indicator namely, macroeconomic stability, market microeconomic efficiency, good governance and social development. Macroeconomic stability describes an economy has a strong economic background that minimized vulnerability to external shock. It characterized by low inflation rate, unemployment rate and external debt and fiscal surplus to GDP. Meanwhile, microeconomic market efficiency pertains the best way of allocating resources by price mechanism in market. It will help the economy quickly adjust to equilibrium. This component consists of the size of government and freedom to trade internationally

indicators. Good governance component is related to the issues of judicial independence, impartiality of courts, the protection of intellectual property rights, military interference in the law, political system and the integrity of the legal system indicators. This component pertain to which extent economic and social system can properly functioning especially during shock. Finally, social development refers to which extent social relations in society are properly developed which allows effectiveness of economy system. This component is subjected to adult literacy rate, school enrolment ratios and life-expectancy indicators. On the other hand, VI pertains the exposure to external shocks arising from economic openness, export concertation and dependence on strategic imports.

Hence, this study categorized countries based on ERI and VI into four group. First group is best – case where countries have high ERI and low VI. Most developed countries such as Denmark, Germany, Belgium, Netherlands, UK, New Zealand, Japan, Switzerland and Canada fall into this group. Second group is self – made refers to high ERI and VI. It includes a small open country such as Singapore, Malaysia, Hong Kong and Luxembourg. Third group is prodigal son that has low ERI and VI where mostly third world countries or less developed countries such as Nepal, Bangladesh, Bolivia, Pakistan and Peru fall into this group. Fourth group is worst – case that has high VI and low ERI which includes a few vulnerable small countries with a weak economic performance such as Belize, Nigeria, Kenya and Senegal.

Likewise, Piccinino and Briguglio (2012) developed growth with resilience (GRW) index. This index assesses the ability to absorb and to counteract external shocks and ability to promote economic growth in a country. The motivation of this study is to investigate the impact of GFC on East Asia, US and European Union (EU) countries. This study proposed the components of GWR index namely, flexibility (credit market regulation, labor market regulation, soundness of banks and product market regulation), stability (inflation, unemployment rate, government deficit to GDP and gross government debt to GDP) and source of growth (investment to GDP and institution quality). The score of GWR index for east Asia countries were higher than US and EU countries. It explained that GFC has a milder impact on east Asia region more than US and EU countries.

In the study of Han and Goetz (2015), they assessed economic resilience in US regions during GFC for 2007 – 2009 period into two stages namely, drop stage and rebound stage. Drop stage pertains the effect of economic recession on employment. It is measured by the deviation of actual employment from the expected employment during recession. Rebound stage represents the velocity of recovery from recession and. It is calculated as the rate of change between employment after recession and the lowest employment during recession. The result showed that southwest and the plain regions have a strong resiliency toward shock where the regions record a small employment drop and fast employment rebound stage during GFC. In contrast, Midwest and New England regions experience a low economic resilience corresponding with a large employment drop and slow employment rebound stage during GFC.

In another study, Fingleton et al. (2012) evaluated the relevance of EER by examining the impact of economic recessions on employment growth in 12 regions of the United Kingdom (UK) for the period 1971 – 2010 by using seemingly unrelated regression (SUR). This study showed that the impact of economic recessions on employment growth in UK regions which also reflects the resistances of the regions to shock, are varied significantly. Moreover, this study examined the recovery from shock that reflects the convergence of employment growth to potential employment growth rate at post – recession. The vector error correction term model (VECM) and impulse response functions (IRF) estimation pointed that a negative shock has negative and significant permanent effect on employment growth in most UK regions which means that employment growth does not revert to pre – recession level and does not lend a support the notion of EER.

Similarly, Caro (2014) investigated economic resilience in term of the changing of employment growth to multiple equilibrium paths after shock by using non – linear smooth autoregressive (STAR) estimation in 20 Italian regions in period 1992 – 2012. This technique allows the evolution employment regime to multiple equilibrium. The result of study showed that Italian experiences a different employment growth rate regime. The central and north regions of Italy tend to have an employment growth regime above than pre – shock employment growth regime. It denotes the employment of the regions return to a better employment regime afters shocks and become resilience. For South region, it found that to have employment growth regime below than pre – shock employment regime which indicates the region is less region to shock.

However, the employment growth employed by Fingleton et al. (2012) and Caro (2014) could be a weak measurement to reflect economic resilience since it does not reflect to which extent an economy deviates from its equilibrium level like output gap measurement. Therefore, the finding of regime changing to multiple equilibrium path that contrary with the notion EER can be misleading. In addition, important variable that determines employment growth was absent in this model which might resulting a bias in estimation.

By using similar technique in the study of Fingleton et al. (2012), Eraydin (2015) investigated the resiliency of 26 Turkish regions in term of output losses during economic shock in period 1978 – 1981. The result of SUR revealed that dummies variable of recession period has a negative impact on GDP growth. It implies that economic recession event significantly leads to increase output loss. However, not all regions are negatively affected by recessionary shocks. Meanwhile, the dummy variables of economic recovery period showed negative sign but insignificant on GDP growth. It implies that many Turkish regions were unable to take advantage of the benefit of the recovery periods.

Based on the finding, Eraydin (2015) then, categorized the type of regional resilience based on their behaviour to economic recession events namely prospering, shock – resistant, resilient and non – resilient regions. Prospering region refers to regions that are not affected by recessionary shock and able to have a positive economic growth in recovery period. Shock resistant refers to regions that experience insignificant output loss

effect during recession period and during recovery period. Meanwhile, resilient region is regions that experiences a declining in economic growth during recession but, have a positive effect of output growth during recovery period. In contrast, non – resilient region refers to regions that have a negative impact of economic growth during recession period and recovery period. The weakness of study is important determinant of economic growth has been omitted in the regression which might causes bias in estimation.

In similar view, Bhattacharya and Dasgupta (2012) examined the resiliency of least developed countries (LDCs) toward GFC in period 2008 – 2009 by using impulse response function (IRF) and Generalized Method of Moments (GMM) methods. The study found that output losses that is measured by declining of GDP growth in LDCs is significantly large. It is mainly caused by declining of foreign direct investment (FDI) and fluctuation in exchange rate and term of trade shocks. The IRF estimation found that the declining of GDP growth is persistent where the growth of GDP remains below the pre – crisis GDP growth trend for at least five years. It suggested that declining in external demand and limited domestic resources mobilisation cause LDCs structurally defenceless to external shocks. In addition, high debt to GDP and low international reserves cause GDP growth in LDCs to be more vulnerable to shock.

From other perspective, Cerra, Panizza and Saxena (2008) investigated economic resilience in term of economic recovery from recessions in 197 countries for period 1960 – 2005. Economic recovery is measured by dummy variable years of positive output growth that are followed after recession period. Then, the recovery speed is captured by

the estimation of the dummy variable on economic growth. The result of fixed effects model (FEM) estimation revealed that the coefficient speed of recovery for industrial countries is 1.04 larger than developing countries 0.36. It implies that industrial countries are more resilient to economic shock compared to developing countries. For Sub – Saharan Africa region, the result showed that an insignificant of speed recovery. The result is likely due to frequently political instability that hampers economic recovery of the region.

From economic stability perspective, Duval et al. (2007) explored economic resilience in term of cyclical fluctuations in economic activity based on different policy and institution setting in labour, product and financial market in OECD countries by using pooled regression analysis across 20 OECD countries over the period 1982 – 2003. Economic resilience consists of two dimensions namely, the effect of shock that causes output fluctuation at potential output and, the subsequent persistent of shock that prolongs output fluctuations. In this study, output fluctuation is measured by output gap. Policies and institutions that associated with rigidities in labour and product market such as employment protection legislation, collective bargaining coverages and product market regulation were found to reduce output gap. It indicates that the policy and institution settings would dampen the initial impact of shock and lead to achieve economic resilience. This concept of economic resilience in this study that captures divergence of output from potential output due to shock is appeared to be consistent with EER theory.

2.3.2 The Behaviour of Fiscal Tools on Economic Resilience

As discussed in Section 2.2.3, fiscal tools play important role on economic resilience by dampening output fluctuations to potential output which in turn, it reduces the effect of shock. Therefore, the behaviour of fiscal tools on output fluctuation can be interpreted as shock – absorber or shock – inducer.

In earlier study, Galí (1994) proposed government size as automatic stabilizers tools based on real business cycle (RBC) model specification that relies on the assumption of expected utility maximization of economy agents. In addition, this study used standard deviation of GDP growth to measure output fluctuation whereas, government size is represented by government expenditure to GDP and government revenue to GDP ratios. In the simple cross countries regression of 22 OECD countries for period 1960 - 1990, an increasing of government revenue to GDP ratio (represented as tax rates) leads to increase standard deviation of GDP growth. It implies that tax rate is procycle response where it would increase output fluctuations and destabilize economy. In contrast, the increasing of government purchases to GDP ratio leads to reduce output fluctuation. It denotes that government purchases to GDP ratio is countercycle response. This response can be interpreted as shock – absorber ability. However, important variables that omitted in this study might produce bias results in estimation.

Fatás and Mihov (2001) have addressed the endogeneity problems in the study of Galí. This problem arises from a reverse causality relationship between fiscal variable and

output fluctuation that causes bias in OLS regression. To overcome the endogeneity problem, two stages least square (2SLS) was employed where the result revealed that automatic stabilizer is countercycle. In addition, important variables such as economic openness, real GDP per capita and real GDP growth were considered in the model. In this respect, an increasing one percent increasing of government expenditure to GDP ratio reduces the standard deviation of real GDP growth in 20 OECD country about eight percent and the US about 13 percent in 1960 – 1997.

The basic relationship between government size and output fluctuation has been extended in several directions. For instance, the failure of Galí's study to incorporate a realistic phenomenon such as market imperfection in RBC model. It causes the Galí's study has no clear connection between government size and output fluctuation. This has motivated Andrés, Doménech and Fatás (2007) to add nominal rigidity in standard RBC model to examine the relationship between government size and output fluctuations. Their calibrated model resulted a negative association between government expenditure to GDP ratio and standard deviation of GDP which is implying a countercycle response of automatic stabilizers. Interestingly, the countercycle of automatic stabilizers becomes less responsive when the rigidity of wage and price is concerned. The result was consistent with Neo – Keynesian theory where the effect of government size does not instantaneously influence output fluctuation, due to the rigidity of price and wage.

In another study, Martinez – Mongay and Sekkat (2005) estimated the model in Fatás and Mihov (2001) by using total tax revenue to GDP ratio as automatic stabilizers variable in

OECD countries for 1960 – 2000 period. The result pointed that tax revenue to GDP is negatively associated with standard deviation of GDP. The finding implies that government revenue to GDP ratio is countercycle response where it can be interpreted as shock – absorber.

Debrun et al. (2008) extended the study of Fatás and Mihov (2001) by employing various automatic stabilizer measurement such as government expenditure to GDP ratio, government expenditure on social security and transfers, direct tax and indirect tax in 20 OECD countries in period 1961 – 1990. Their finding reveals that the countercycle of automatic stabilizers has been disappeared in these countries since 1990s. The pooled OLS and 2SLS estimation revealed that standard deviation of real GDP per capita growth is negatively associated with all the automatic stabilizer measurements. However, the relationship is found to be insignificant in period 1990 – 2007. Moreover, the effect of automatic stabilizers tool has been decreased overtime in non – linearity trend when interaction term of squared – government size positively and significantly associates with output fluctuation. Based on this finding, Aghion, George – Marios, Banerjee and Kalina (2006) argued that monetary policy and financial liberalization take up the role devoted to fiscal policy by allowing more households to have access to financial sources and self – insure themselves against income fluctuation.

In the other techniques of estimation, McKay and Ries (2013) revealed that tax rates as automatic stabilizer tool is countercycle response in US in 1988 – 2007 by using solution algorithm method. This technique is featured by a linear rational expectation algorithm

that pertains the dynamic of an economy as perturbations are around the stationary equilibrium. This study also employed the variance of nominal GDP as output fluctuation measurement. The finding revealed that one percent decreasing in proportional taxes (total corporate income, property, sales and excise taxes revenue) and progressive taxes (total income tax revenue) reduce the variance of nominal GDP by less than one percent. Meanwhile, one percent increasing in transfer payment reduces the variance of nominal GDP by four percent.

For discretionary fiscal tool, cyclical adjusted balance (CAB) has been used to measure this tool. For instances, Fatás and Mihov (2012) incorporated the optimal macroeconomic policy model to investigate cyclical behaviour between automatic stabilizer and discretionary fiscal in 23 OECD countries for period 1960 – 2010. This study used CAB to measure discretionary fiscal. Meanwhile, budget balance to GDP was employed as automatic stabilizer variable for the fact that government expenditure and tax revenue are adjusted to cyclical change (Blanchard, 1993). By using Panel OLS and 2SLS, their finding revealed that the countercycle response of automatic stabilizer tool is between 0.3 – 0.5 percent which larger than discretionary tool that is between 0.09 – 0.2 percent.

Correspondingly, Debrun and Kapoor (2010) revisited the link between fiscal tools and output fluctuation by expanding the sample to 49 countries that covers advanced countries and developing countries in period 1970 – 2006. Pooled OLS and 2SLS estimation showed that CAB which is represented as discretionary tools positively associates with standard deviation of real GDP growth for developing countries but, statistically

insignificant for advanced countries. It implies discretionary fiscal is procycle in developing countries. In contrast, one percent the increases of government expenditure to GDP ratio reduces standard deviation of real GDP growth by 1.6 and 1.4 percent in advanced countries and developing countries, respectively. It indicates that automatic stabilizers tool is countercycle in the both countries.

In the other study, Bogdanov (2010) utilized CAB and tax revenue on income, profit and capital gains per capita to reflect automatic stabilizer tools in examining the effect of fiscal policy on output volatility in seven developed countries and 23 developing countries in period 1972 – 2001. This study used absolute output gap per capita as output fluctuation measurement. Panel Random Effect model estimation revealed that the increasing of one percent automatic stabilizer reduces absolute output gap per capita in developed country by 2.4 percent and developing country by 3.6 percent. In contrast, discretionary fiscal tool is insignificant to reduce output fluctuation for both groups. It implies that automatic stabilizers tool is countercycle response whereas, discretionary fiscal tool is acycle (neither procycle or countercycle) response.

On the other hand, Eller, Fidrmuc and Fungáčová (2013) examined the relationship between discretionary fiscal and output fluctuation in Russia regions from 2000 – 2009 by using GMM technique. This technique commonly exploits the lagged of explanatory variables as instruments variable (IV) in order to solve for endogeneity problem. Moreover, this study also followed Fatás and Mihov (2003) technique to measure discretionary fiscal: error term, ε is obtained from the estimation of government

expenditure on inflation, national income and price level. ε is considered as discretionary fiscal variable. This study revealed that ε and CAB is positively associated with standard deviation of industrial production index as output fluctuation variables. It implies that CAB is procycle response that plays shock – inducer role to amplify output fluctuations in the regions. Meanwhile, government expenditure to GDP as automatic stabilizers is insignificantly associated with output fluctuation.

Similarly, Badinger (2009) investigated the potential destabilizing of discretionary fiscal on output in 20 OECD countries in period 1990 – 2002. This study utilized the technique proposed by Fatás and Mihov (2003) to measure discretionary where various fiscal variables such as government consumption, government spending, total primary government spending (minus interest rate payment), total government revenue and fiscal balance. These fiscal variables were estimated on inflation rate, output growth and the lag of crude oil price, and the lag of the employed fiscal variables. The error term in regression was taken as fiscal discretionary shock and then, transformed into standard deviation of government consumption, government spending, total primary government spending, total government revenue and fiscal balance to reflect the aggressiveness of fiscal discretionary. The panel OLS and GMM estimations revealed that all fiscal discretionary aggressiveness variables are negatively associated with standard deviation of real GDP per capita growth. It implies that the increasing of discretionary fiscal aggressiveness tends to stabilize output fluctuation.

2.3.3 Issues of Fiscal Policy on Economic Resilience

There was a raising attention on the effect of fiscal policy on output fluctuations between developed, OECD, developing and non – OECD countries. The studies have explored the fiscal response on output fluctuation from various issues.

For instance, Lane (2003) examine the response of fiscal policy on output fluctuation by addressing political issues across 22 OECD countries for period 1960 – 1988 based on two steps. The first step is to determine the cyclicality response of fiscal policy on output growth. The finding showed that an increasing on real GDP growth leads to decrease current government expenditure and to increase government consumption and government investment. The result indicates that government expenditure is countercycle response and government consumption and government investment are procycle response. The second step is to investigate the cyclicality response of the fiscal variables on output fluctuations. By using weighted least square (WLS), Lane (2003) revealed that the countercycle response of current government spending is positively associated with the standard deviation of real GDP growth. It implies that an increasing output fluctuation tend to increase countercyclicality of current government spending. In contrast, the procycle response of government consumption and government investment are insignificant to associate with standard deviation of real GDP growth. The political dispersion variable has been found to increase the procyclicality of government consumption. Tornell and Lane (1998) argued that the more power is diffused among a number of government branches witness a high intensity of fiscal needs therefore, it

causes an excessive government consumption during economic booming and contributes a limited government expenditure during recession. Hence, causing the procyclicality of fiscal policy. This phenomenon is known as voracity effect.

Meanwhile, Aghion and Marinescu (2008) revealed that fiscal policy was countercycle response in selected OECD countries during 1960 – 2010. This study used output gap to measure output fluctuation variables. The result of Gaussian weighted OLS estimation suggested that budget deficit increases by 0.5 percent when output gap is decreasing by one percent. In autoregressive process of Markov chain, Monte Carlo simulation revealed that the countercycle response of budget deficit has been increased since 1980s. The result suggested that highly developed financial sector, good coordination between monetary policy and fiscal policy and, low trade openness tend to facilitate the countercycle of fiscal policy in OECD countries. This result is appeared to be contrary with the findings of Debrun et al. (2008).

Similar to the work of Lane (2003), Alesina and Tabelline (2005) addressed the political factor that associated with the relationship between fiscal policy and output fluctuation. The idea of study relied on an agency problem assumption: political agency can lead to excessive debt accumulation and voters are uninformed about fiscal deficit. Therefore, it causes a distorted fiscal policy. In panel OLS estimation, Alesina and Tabelline (2005) revealed that fiscal policy is a procycle response where government expenditure is positively associated with GDP gap variable whereas, government revenue and fiscal surplus are found to be negatively associated with GDP gap in developing or non – OECD

countries. In contrast, fiscal policy is a countercycle response in developed and OECD countries. By concerning the control of corruption index to reflect political distortion in the model, the procycle response coefficient is slightly increasing. It implies that the countries with a high corruption tend to experience more procycle response in fiscal policy. However, potential endogeneity problem in regression has been neglected in this study might leads to a bias result in estimation.

Moreover, Talvi and Végh (2005) extended the work of Lane (2003) by incorporating standard optimal fiscal policy model to examine the behaviour of fiscal policy to output fluctuation in 56 developing and developed countries for period 1970 – 1994. In this study, they concerned political distortion issue. The result of correlation analysis revealed that fiscal policy in developing countries is highly procycle response. The correlation coefficient between standard deviation of real GDP (as output fluctuation measurement) and government consumption for developing countries is 0.53 whereas, the correlation is 0.17 but insignificant for developed countries. For tax rates side, the correlation between government revenue and the standard deviation of real GDP is 0.52 in developing countries and 0.31 in developed countries. In this regard, the procycle response of government consumption in developing countries is due to political distortion. It causes government consumption for non – productive purpose to increase over years hence, imposing more cost to run budget surplus. Governments that are facing a large fluctuation in tax revenue tend to reduce (increase) taxes and increase (decrease) government expenditure in good times (bad times) where it causes a procycle bias in fiscal policy.

Corresponding with the work of Alesina and Tabelline (2005), Andersen and Hobøll (2010) addressed fiscal transparency issues that associates with fiscal reaction to output fluctuation. Fiscal transparency is related to ability of politicians to hide the true size of fiscal deficit to voters. Therefore, the voters unable to observe the level of political distortions. In this study, they revealed that fiscal tools are procycle in 21 OECD countries and acycle (neither procycle nor countercycle) in non – OECD countries for 1989 – 2003 period. Instead of CAB, cyclical adjusted government expenditure (CAG) was utilized as discretionary tools since the study focused on government expenditure side. The result of GMM estimation pointed that CAG and government expenditure to GDP ratio are positively associated with output gap, during good time (output gap positive) but, insignificant during bad time (output gap negative) in OECD countries. For non – OECD or developing countries, fiscal policy is acycle response where government expenditure to GDP and CAG are insignificantly associated with output gap, during both bad and good times. It confirmed that the procycle bias in the government expenditure due to the lack of fiscal transparency arises only in good time. In this respect, this scenario causes an excessive government expenditure during good time.

In the same view, Fatima and Uma (2011) tested "good policy" hypothesis that reduces output fluctuations in South Africa for period 1976 – 2004. Autoregressive distributed lag (ARDL) model featuring with structural break revealed that total government expenditure to GDP insignificantly reduces real GDP growth gap, compared to monetary policy indicator (MPI) negatively which associated with real GDP growth gap. The "good policy" hypothesis is valid for monetary policy, but not for fiscal policy. This is in line

with belief that monetary policy is more systematically decisive and more transparent policy to reduce output fluctuation compared to fiscal policy (Ramey & Vine, 2004).

Calderón and Schmidt – Hebbel (2008) concerned institutional factor and liquidity constraints that have been faced by government in explaining fiscal cyclicality response in selected industrial and developing countries for 1970 – 2005 period. The study hypothesized that liquidity constraint prevents governments to borrow from credit market during recession and unable them to deliver fiscal stabilization. Thereby, it leads to a procycle response (Gavin & Perotti, 1997). Meanwhile, a high institutional quality reduces political distortion. Thereby, it ensures government revenue is saved in good time so that, government can deliver fiscal policy smoothly in bad time. The pooled OLS and 2SLS estimations suggested that government expenditure and budget balance follow countercycle response. The increasing of one percent in standard deviation of real GDP leads to enhance 5.5 percent of central government expenditure to GDP in industrial country and 1.7 percent in developing countries. On the other hand, fiscal balance to GDP ratio decreases about two percent in industrial country and 0.8 percent in developing countries as standard deviation of real GDP is increasing by one percent. However, government revenue to GDP ratio is statistically insignificant for both country groups. The result also supports the hypotheses where fiscal policy is less countercycle response if institutional quality and access to credit market are poor.

Similarly, Frankel et al. (2013) concerned institutional factor in examining the cyclicality of fiscal policy in 73 developing and emerging countries for the 1960 – 2006 period. FEM

and 2SLS estimation revealed that real government expenditure gap is positively associated with real GDP gap. It implies that government expenditure is a procycle response. This study suggested that a causal link running from stronger institutional quality to less procycle or more countercycle of fiscal policy. It is consistent with the finding of Calderón and Schmidt – Hebbel (2008).

Fiscal sustainability is another issue that associates with the effect of fiscal policy on output fluctuation. It pertains the state where government expenditure is smoothly financed without causes a high fiscal deficit and public debt. For instances, Staehr (2007) explored the cyclical behaviour of fiscal policy in European regions for the period 1995 – 2005. It revealed that fiscal policy in Eastern European countries exhibits more countercycle than Western European countries. The GMM estimation pointed that one percent the increasing of fiscal balance to GDP ratio causes GDP gap to decrease by 0.31 percent in Western Europe and 0.5 percent in Eastern Europe. In this sense, the countercycle of fiscal balance to GDP ratio in Eastern Europe is found to be less inertia (easier to adjust budget balance with cyclical change) because of low government debt and less persistent in budget deficit.

In another study, IMF (2015) revealed that fiscal stabilization leads to reduce output fluctuation in selected advanced countries and, emerging and developing countries for the period 1980 – 2013. In this study, fiscal stabilization is captured by estimated coefficient of fiscal balance on output gap. The coefficient which in turn, is regressed with standard deviation of real GDP growth. The GMM estimation showed that one percent increasing

in fiscal stabilization leads to reduce standard deviation of real GDP growth by 20 percent in advanced countries and emerging and developing countries by five percent. It implies that the countercycle response in developed countries is larger developing country. It is because developing countries need a continuously fiscal expansionary during good time to enhance economic and social infrastructure such as road, port and power plant especially, when private sector is weak and underdeveloped. Therefore, it undermines the countercycle response of fiscal policy.

2.3.4 Issues of Fiscal Policy on Economic Resilience in the ASEAN – 5 Countries

This section discusses issues that determine fiscal cyclicality over business cycle in ASEAN – 5 countries. Previous researches have addressed many issues that influences the impact of fiscal policy on aggregate output. Thereby, the highlighted issues could contribute some insights about the effectiveness of fiscal policy on aggregate output fluctuation which in turn, influences the role of fiscal policy on economic resilience.

Fiscal sustainability is a factor that influences the effect of fiscal policy on output fluctuation. Fiscal sustainability is a state where government can be smoothly financed without increases public debt. Adams, Ferrarini and Park (2010) revealed that fiscal sustainability facilitates countercycle response of fiscal policy in 30 developing Asia countries for the period 1990 – 2008. Feasible generalized least square (FGLS), panel OLS and GMM estimations revealed that fiscal balance that represents fiscal sustainability is positively associated with real GDP gap which the coefficients are about

0.05 – 0.8. Interestingly, government debt to GDP has positive nonlinear association with primary fiscal balance. It implies that government debt contributes to a fiscal surplus and increases fiscal sustainability. However, the surplus decreased as government debt to GDP increases.

In addition, Hur, Jha, Park and Quising (2010) argued that developing Asia countries are capable to deliver sizeable fiscal stimulus packages during GFC. It was due to a strong fiscal sustainability before economic crisis where most of the countries already had low fiscal deficit and debt position. Panel VAR (PVAR) analysis revealed that fiscal policy measured by government expenditure gap negatively associated with GDP gap by 0.12 percent. It implies the implication of sizeable fiscal stimulus is countercycle response during GFC period. In contrast, government revenue gap does not have significant effect on GDP gap. It suggested that tax rate program was only smaller part of fiscal stimulus packages.

Another issue that is related with fiscal cyclicality response is crowding out effect on aggregate output. There are many channels that explains this effect. For example, Jha et al. (2010) found that government expenditure is less effective to stimulate output compared to tax rate in ASEAN – 5 countries for 1995 – 2004 period. The impulse response of VAR model showed that government expenditure has a positive impact on economy in short run. But, in long run, government expenditure causes crowding out effect that increases government debt and interest rate and, discourages investment in long – run.

Moreover, Jha et al. (2014) found that crowding out effect in the ASEAN – 5 countries is caused by the opposite effect between government expenditure and government revenue on output in ASEAN – 5 countries. The impulse response analysis on SVAR model indicates that fiscal policy has a little stabilizing on GDP due to opposite effect between government expenditure and government revenue on GDP output. A shock of government expenditure causes a negative impact on GDP, whereas a shock of government revenue leads to a positive impact on GDP. This study indicates that government expenditure which is financed by government debt will be translated into a high tax in the future. It causes a negative wealth effect that reduces consumption, investment and output. Therefore, it reduces countercycle response of fiscal policy.

Meanwhile, Tang et al. (2013) lend a support on crowding out effect in the ASEAN – 5 countries. It revealed that government expenditure multiplier on output is weak and very small, as shown in impulse response analysis on small open economy time – varying model for the period 1990 – 2009. There were two suggested channels that explains the crowding out effects in the countries. First, a high degree of economic openness in the countries causes leakages of government expenditure through import and reduces the effect of government expenditure. Second, interest rates were allowed to fall too much until they reach to zero interest rate boundary. It causes a lack of accommodative monetary policy that might mitigate or even reverse the impact of fiscal stabilization on output.

The crowding out effect also supported by Kawai and Zhai (2010) who explored short – term and medium – term impact of GFC and the implication post – crisis adjustment in Emerging East Asia (EEA) countries to world economy. This study calibrated dynamic global general equilibrium model to derive trends of macroeconomics movement around steady state of equilibrium path during GFC in 2009. The simulation result depicted that there is 1.5 percent increasing in real GDP after two years – fiscal stimulus packages effect. However, it decreases by 0.2 percent after completion of fiscal stimulus which is mainly due to crowding out effect via two channels namely, public debt and import. The fiscal stimulus arising from accumulation public debt would induce more interest rate and it is followed by falling in private investment by more than two percent. Government expenditure would largely leak through import if trade openness is high which in turn, reduce the effect of fiscal stimulus on aggregate output.

Also, Eskesen (2009) found that the countercycle response of fiscal policy in Singapore for the period 1990 – 2007 is short – lived due to a crowding out effect. It suggested that factor such as credit constraints facing by economic agents, low consumption propensity and high saving propensity, trade openness (i.e. remittances of non-resident worker) and the lack of accommodative monetary policy would offset the positive impact of fiscal policy on aggregate output. Impulse response analysis on SVAR model based on quarterly data showed that a shock of real government expenditure and real government revenue leads to increase real private AD and output. However, this response was short lived where the response on output is slightly becoming negative in long run.

Meanwhile, political factor is also a factor that influences cyclicality of fiscal policy in some ASEAN – 5 countries. For instance, Khan (2011) revealed that institutional quality such as corruption level influences the cyclicality of fiscal policy in 28 Asia developing countries for the period 1999 – 2009. Panel OLS estimation based on monthly data shows that fiscal policy is a procycle response. An increasing of real GDP gap leads to increase government expenditure in lower middle – income group such as Thailand, Indonesia and the Philippines by 0.12 percent and in higher middle – income group such as Malaysia and Singapore by 0.05 percent. In this respect, the procycle response is determined by corruption level where, a high corruption country experiences a high procycle response.

2.4 Literature Gap

There were several gaps has been identified from the literatures. First, in term of economic stability, economic resilience has been limited explored by previous studies. In this review, the empirical works of economic resilience that is related with economic stability tends to concentrated on OECD countries. However, In the context of ASEAN – 5, there are considerably very few and limited study which specifically aimed at empirically examining economic resilience from economic stability perspective in term of shock amplification and shock persistent.

Second, there is inconclusive finding regarding the role of fiscal as shock – absorber in developing countries. Previous studies such as Agénor et al. (1999), Lee and Sung (2007), Calderón and Schmid – Hebbel (2008), Bogdanov (2010), Debrun and Kapoor (2010) and

IMF (2015) revealed that fiscal policy as countercycle response in developing countries. This response is translated into shock – absorber ability. In contrast, Talvi and Végh (2005), Alesina and Tabelline (2005), Manasse (2006), Hakura (2007), Ilzetzki and Végh (2008), Andersen and Hobøll (2010) and Frankel et al. (2013) revealed that fiscal policy as procycle response, implying that fiscal policy is shock – inducer. Therefore, further exploration is needed to a shed light upon the role of fiscal policy on economic resilience, particularly in ASEAN – 5 countries.

Third, the role of fiscal tools to output fluctuation is still neglected specifically for ASEAN – 5 cases. Previous studies such as Adams et al. (2010), Hur et al. (2010) and Khan (2011) tend to concentrate the effect of government expenditure and tax rate on output fluctuation in Asian developing countries. In fact, government expenditure and tax revenue (as tax rate measurement) are combination between economic stabilizing purpose and economic development purpose (Park, 2010; Abdon et al., 2014). This could contribute the loss of information related to the output stabilizing when using fiscal variable at aggregate level. On the other hand, automatic stabilizers and discretionary fiscal tools are built to stabilize output in business cycle. Thereby, more attention should be given on these fiscal tools rather that fiscal variable at aggregate level for ASEAN-5 countries.

Fourth, the most of studies such as Fatás and Mihov (2001), Lane (2003), Talvi and Végh (2005), Andrés et al. (2007), Debrun et al. (2008), Debrun and Kapoor (2010), Andersen and Hobøll (2010), Fatás and Mihov (2012) tend to rely on the Keynesian assumption

where the impact of fiscal impact on output fluctuation is only exist in short – run. This is because the rigidity of price and wage delay the adjustment output fluctuation (due to fiscal policy and monetary policy settings) toward potential output in short – run. In long – run, the economy has sufficient time to adjust price and wage levels which causes aggregate output to stay at potential output in long – run. Thus, fiscal stabilization on output fluctuation only occurs in short – run. However, Easterly, Islam and Stiglitz (2000), Dutt and Ros (2007), Park (2010) and Hall (2011, 2015), argued that prolonged output fluctuation from potential output is likely to persist in long – run due to the inadequate of AD in economy. Thus, the impact of fiscal policy on output fluctuation should be also examined in long – run perspective. Yet, there is still a lack of the empirical studies that explores the impact of fiscal stabilization on output fluctuation in long – run.

In term of methodology, most of the previous studies concentrate on solving endogeneity problem that is arising from reverse causality relationship between fiscal policy and output fluctuation. Therefore, these studies only concentrate on 2SLS and GMM techniques in panel analysis to overcome this problem. Moreover, by using 2SLS and GMM technique, a large number of sample and short time period are required in order to obtain efficient estimated coefficient. Because of the endogeneity problem, there is a limited choice on estimation techniques in examining the effect of fiscal policy on output fluctuation.

2.5 Conclusion

In this review, previous study provides some findings about the relationship between output fluctuation and fiscal policy. These findings could give insight about the ability of fiscal policy as shock - absorber that contribute to a resiliency in a country. Moreover, this review helps to build a theoretical framework.

CHAPTER 3

RESEARCH METHODOLOGY

3.1 Introduction

This chapter is dedicated to methodology and conceptual framework of the study. The chapter consists of eight main sections. Section 3.2 discusses conceptual of the study. Meanwhile, Section 3.3 presents the model to be estimated in order to answer the objectives of the study. In Section 3.4, justification for the variables included in the model of study are presented. Section 3.5 explains data sources and study sample. Section 3.6 discusses method of analysis that leads to achieve objective of the study. Finally, the chapter is concluded by Section 3.7.

3.2 Conceptual Framework

The main focus of this study is to measure economic resilience and to investigate the effect of fiscal policy on economic resilience in ASEAN-5 countries. The measurement of economic resilience consists of: shock amplification and shock persistent dimension which can be shown in Figure 3.1. Shock amplification is related to size of output fluctuation from potential output. This measurement is based on the study of Duval et al. (2007). This study proposed a regression analysis which provides a separation of output gap that measures output fluctuation into: common component across countries and

individual country variation around common components. More specifically, the composition of output gap is given by Equation [3.1]:

$$[3.1] \quad GAP_{it} = \lambda_t + \gamma + (\gamma_i - \gamma) + \varepsilon_{it} \quad t = 1, 2, 3 \ldots T \quad i = 1, 2, 3 \ldots N$$

where;

GAP_{it} = output gap

λ_t = time fixed effect

γ_i = individual country fixed effect

γ = common country fixed effect

ε_{it} = error term

and i and t are country and time suffixes, respectively. Equation [3.1] indicates that λ_t captures an set of undefined shocks that are common to all countries at particular time period. In the model, the common component is $\lambda_t + \gamma$ and the individual country variation component is $(\gamma_i - \gamma) + \varepsilon_{it}$. Duval et al. (2007) define γ_i as country – specific reaction to common shocks, λ_t which can be translated to country – specific shock amplification.

Meanwhile, Dutt and Ros (2007) and Duval et al. (2007) argued that output gap can be persistent overtime which it reflects the persistent of shock in the business cycle. It is argued that shock persistent relies upon the ρ – order autoregressive process, AR (ρ) of output gap. For instances, first – order autoregressive, AR(1) process of output gap

represents regression of output gap due to one – lagged year output gap which can be written as Equation [3.2].

[3.2] $GAP_{i,t} = \alpha + \varphi GAP_{i,t-1} + \varepsilon_{it}$

where;

$GAP_{i,t-1}$ = output gap lagged one year

The coefficient of $GAP_{i,t-1}$, φ in Equation [3.2] captures the size of shock persistent. Thus, the higher value of φ the higher persistent is.

For other objectives, the effect of fiscal policy on economic resilience can be seen in Figure 3.1. The effect of fiscal policy on economic resilience is explained by aggregate demand (AD) – aggregate supply (AS) model of Keynesian theory. The theory explains that the interaction between AD and AS that is resulting an economy to achieve equilibrium at particular level of price and output. Suppose AD shock gives a temporary economic deviation from equilibrium. To be resilient from the shock, the economy must be adjusted back toward to the equilibrium. Eventually, it leads the economy to achieve stability at equilibrium.

Fiscal tools such as automatic stabilizer measured by government expenditure to GDP ratio and discretionary fiscal measured by CAB are expected to cause an economy to be resilient. During recession, the increasing of government expenditure to GDP ratio and

CAB will increase private investment, household spending and aggregate output and reduce unemployment rate. Thereby, these fiscal tools bring back aggregate output to potential output and decrease output gap. Meanwhile, to reduce inflationary pressure during economic booming, government expenditure to GDP ratio and CAB will be decreased which in turn, reduce private investment, household spending and, aggregate output and bring aggregate output toward potential output and decrease output gap. This study therefore hypothesizes that a negative impact on output gap where it leads ASEAN -5 economies to be resilient.

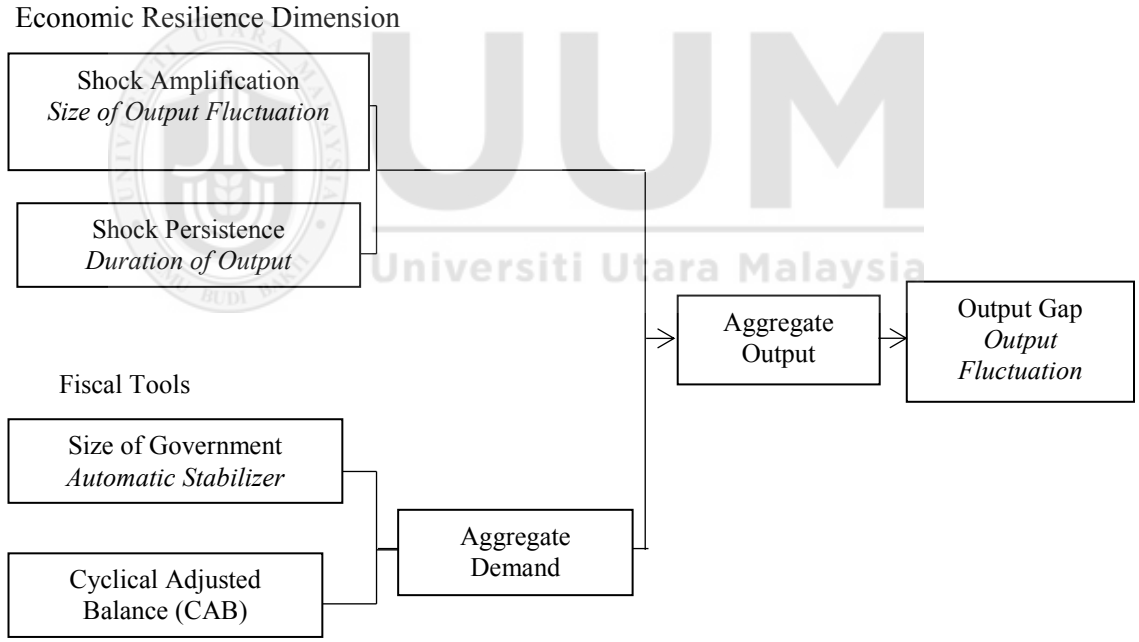

Figure 3.1
Research Framework

3.3 Model of the Study

The measurement of economic resilience in this study based on shock amplification and shock persistent dimensions which are proposed by Duval et al. (2007). Without loss of generalization, the modified time series model that suit with this study is shown in Equation [3.3] – Equation [3.5] to determine the dimension of shock amplification and shock persistent.

[3.3] $$LGAP_t = \alpha + \varphi LGAP_{t-1} + \lambda CRS_t(1 + \gamma GSZ_t) + \varepsilon_t$$

[3.4] $$LGAP_t = \alpha + \varphi LGAP_{t-1} + \lambda CRS_t + \lambda\gamma(CRS_t{}^{*} GSZ_t) + \varepsilon_t$$

[3.5] $$LGAP_t = \alpha + \varphi LGAP_{t-1} + \lambda CRS_t + \theta(CRS_t{}^{*} GSZ_t) + \varepsilon_t$$

where;

$LGAP_t$ = log of GDP gap to GDP potential (%)

CRS_t = time dummy variable during common economic crisis. 1 is during GFC or AFC and 0 for normal time

GSZ_t = government expenditure to GDP ratio (%)

According to Duval et al. (2007), the model specification in Equation [3.3] and Equation [3.4] imply that the size of shock amplification, γ presents country specific reaction to common shock, λ and can be measured as to the reaction of certain policy response. In

this study, automatic stabilizer[5], GSZ_t is utilized to represent the reaction of policy response in the models. To coefficient value of γ from Equation [3.5] can be extracted by using Equation [3.6]:

[3.6] $$\gamma = \frac{\theta}{\lambda}$$

γ is expected to be positive for the fact that common economic crisis amplifies output gap from potential output. Also, the coefficient of φ in Equation [3.3] – Equation [3.5] captures the AR(1) process of output gap which represents the size of shock persistent. This coefficient value of φ is expected to be positive as the lagged output gap can contribute to the increasing of current output gap.

In the second and third objectives of the study, automatic stabilizers model and discretionary fiscal model are utilized. Automatic stabilizers model shows the relationship between automatic stabilizer and output gap which is proposed by Galí (1994) and extended by Debrun et al. (2008). Meanwhile, discretionary fiscal model shows the relationship between discretionary fiscal and output gap based on Fatás and Mihov (2012). This study, therefore, presents the model of automatic stabilizers and discretionary fiscal for each the ASEAN – 5 countries in Equation [3.7] and Equation [3.8], respectively.

[5] Since this the scope of this study focus on fiscal policy, automatic stabilizer tool is used in the model specification. In addition, the main objectives of the Equation [3.3] – Equation [3.5] is to determine shock amplification. Thus, the impact of automatic stabilizer on output gap is not yet to be concerned in this model.

[3.7] $$LGAP_t = \beta_0 + \beta_1 LGAP_{t-1} + \beta_2 LGSZ_t + \beta_3 LINT_t + \beta_4 LCRDT_t + \beta_5 LOPN_t + \varepsilon_t$$

where;

$LGAP_t$ = the log of GDP gap to potential GDP ratio (%)

$LGAP_{t-1}$ = the log of GDP gap to potential GDP ratio lagged one year (%)

$LGSZ_t$ = the log of government expenditure to GDP ratio (%)

$LINT_t$ = the log of lending rate (%)

$LCRDT_t$ = the log of total domestic credit to GDP ratio (%)

$LOPN_t$ = the log of total export and import to GDP ratio (%)

β_0 = Intercept

ε_t = the error term.

[3.8] $$LGAP_t = \alpha_0 + \alpha_1 LGAP_{t-1} + \alpha_2 LCAB_t + \alpha_3 LINT_t + \alpha_4 LCRDT_t + \alpha_5 LOPN_t + \varepsilon_t$$

where;

$LCAB_t$ = the log of cyclical adjusted balance (%)

Specifically, in Equation [3.7] and Equation [3.8], the β_2 and α_2 capture the government size and CAB response to output gap variables, $LGAP$, respectively. The government size and CAB responses are countercycle behaviour if $\beta_2 < 0$ and $\alpha_2 < 0$, respectively. On other hand, $\beta_2 > 0$ and $\alpha_2 > 0$, it indicates that government size and CAB are procycle responses, respectively.

3.4 Justification of Variables

This section provides the explanation of variables in the models of the study. The justification includes the definition of variable in the model, measurements of the variable, previous studies that used the variables and the hypotheses of the variables.

3.4.1 Output Gap

Output gap is dependent variable for this study. Output gap actually measures cyclical output trend to explain output fluctuation in business cycle. Output gap can be calculated by using Equation [3.9]:

[3.9] $$GAP_t = GDP_t - GDP_t^*$$

where;

GDP_t = gross domestic product

GDP_t^* = potential gross domestic product

Based on Equation [3.9], potential output is unobserved. Hodrick – Prescott (HP) Filter method is used to estimate potential output. According to Murray (2014), this filter extracts a smoothed trend from an GDP series which makes the trend moves approximates the path of potential output. This filter is based on two beliefs. First, GDP does not deviate too far from its trend level and second, the growth of potential GDP is relatively smooth

(not too volatile). Based on these beliefs, potential output is estimated by using Equation [3.10]:

[3.10] $$\sum_{t=1}^{T}(\frac{1}{\sigma_1^2}(GAP_t)^2 + \frac{1}{\sigma_2^2}(\Delta GDP_{t+1}^* - \Delta GDP_t^*)^2)$$

where;

σ_1^2 = the variance of output gap

σ_2^2 = the variance of trend growth

The filter chooses GDP_{it}^* such that loss function in Equation [3.10] is minimized. The users of HP filter can specify the relative of on two beliefs by constraining the ratio of two variance terms to be equal at specific value, given by λ as shown in Equation [3.11]:

[3.11] $$\lambda = \frac{\sigma_1^2}{\sigma_2^2}$$

In this regard, parameter λ value set at 100 was commonly used to estimate annually data series (Grigoli, Herman, Swiston & Bella, 2015). The output gap has been used to measure output fluctuation by Kaminsky et al. (2005), Alesina and Tabelline (2005), Staehr (2007), Aghion and Marinescu (2008), Andersen and Hobøll (2010) and Tagkalakis (2011). In the context of this study, GDP at constant price is used to in order to measure real GDP gap. The advantage of using output gap as output fluctuation measurement is it can capture a set of shocks (rather than a single shock) that occurs in a particular period.

Therefore, it allows a study to investigate the resiliency of economy to shock overtime rather than at a particular shock event (Duval et al., 2007)

3.4.2 Government Size

Government size (GSZ) reflects the degree of government intervention in economy. As discussed earlier, Galí (1994) proposed that automatic stabilizer tool is reflected by the size of government to insure an economy from adverse shock. In this respect, government size is commonly measured by government expenditure to GDP ratio (%). This measurement has been employed by Fatás and Mihov (2001), Fatás and Mihov (2006), Debrun et al. (2008), Tagkalakis (2011), Fatima and Uma (2011) and, Fatás and Mihov (2012). These studies hypothesized that government expenditure to GDP is negatively associates with output gap. It denotes that government size leads to dampen output fluctuation.

3.4.3 Cyclical Adjusted Balance

Cyclical adjusted balance (CAB) prevailed the fiscal budget position when aggregate output at potential output. To define CAB, there are two types of cyclical properties of overall budget balance: cyclical balance (CB) and CAB. CB refers budget balance that response to cyclical changes in business cycle. By construction, CB is near to zero when output is close to potential output level. Budget balance (BB) can be written as Equation[3.12].

[3.12] $BB_t = R_t - G_t$

where;

BB_t = budget balance

R_t = government revenue

G_t = government expenditure

By subtracting BB with CB, it yields CAB which is given by Equation [3.13].

[3.13] $\mathrm{CAB_t} = \mathrm{BB_t} - \mathrm{CB_t}$

Contrary to CB definition, CAB is under fiscal authority control where it is caused by discretionary action of policymakers. Debrun and Kapoor (2010) presented CAB measurement which can be seen in Equation [3.14]:

[3.14] $CAB_t = r_t \left(\frac{GDP_t^*}{GDP_t}\right)^{\varepsilon_{R-1}} - g_t \left(\frac{GDP_t^*}{GDP_t}\right)^{\varepsilon_{G-1}}$

where;

CAB_t = cyclical adjusted balance

GDP_t^* = potential GDP

r_t = government revenue to GDP

g_t = government expenditure to GDP ratio

ε_R = the elasticity of government revenue

ε_G = the elasticity of government expenditure

As suggested by Girouard and André (2005), the value of ε_R is set to 1 and ε_G to 0 where this setting has been broadly supported by cross – country empirical studies. By using the setting values, Equation [3.10] will be simplified into Equation [3.15]

[3.15] $CAB_t = b_t - g_t GAP_t$

where;

b_t = budget balance to GDP

GAP_t = GDP gap to potential GDP ratio.

The CAB as fiscal discretionary measurement has been used by Debrun et al. (2008), Debrun and Kapoor (2010), Fatás and Mihov (2012) and Eller et al. (2013). These studies hypothesized that CAB is negatively associates with output gap. It denotes that CAB leads to dampen output fluctuation.

3.4.4 Nominal Interest Rate

Nominal interest rate (INT) refers to short term interest rate on loans or, the rate at which short term government paper is issued or traded in financial market (OECD, 2016). This measurement has been employed by previous studies such as Tujula and Wolswijiki (2004), Christiano, Eichenbaum and Robelo (2011), Fernández – Villaverde, Guerrón –

Quintana, Kuester and Rubio – Ramírez (2011) and, Ramey and Zubairy (2014) to examine relationship between monetary policy and output gap.

This study employs nominal lending rate to represent short term nominal interest rate, as utilized by Kaminsky *et al*. (2008) and Khan (2011). In this respect, lending rate is bank rate that fulfil the short – term for financing needs of the private sector (World Bank, 2015). These studies hypothesized that the relationship between short – term interest rate and output gap is either positive or negative. In Taylor's (1995) rule, it is argued that a central bank adjusts real interest rate, aimed for reducing actual inflation to targeted level or reducing output deviation to potential output. If a central bank pursues the objective of output stability rather than the objective of price stability, the central bank will reduce interest rate to stimulate AD, aggregate output and dampen output gap to potential output during bad time (negative output gap). At the same time, economic would bear with increasing price level due to increasing of AD. Thus, monetary policy is considered as countercycle response. In contrast, if central bank aims for price stability rather than output stability during bad time, the central bank will increase interest rate and reduce AD and inflationary pressures. Hence, it amplifies output gap from potential output.

3.4.5 Financial Development

Financial development (CRDT) is an important factor that can influence output fluctuation. It represents to which extent private sector activities are financed by financial institutions. Financial institution would act as an income stabilizer that helps to smooth

income volatility during economic shock by providing credit to household and firms and overcome liquidity constraint in economy. Thereby, financial development can be a crucial factor that ensures income smoothing during economic shock. A developed financial sector allows bankers being better to screen borrowers, to identify viable projects and, to allocate funds only for project with low failure probability (Manove, Padilla & Pagano, 2001). It contributes to the reduction of credit market imperfection and liquidity constraint. Therefore, it permits households to smooth their consumption and firms can invest more steadily even facing short-term income fluctuation (Debrun & Kapoor, 2010).

Total domestic credit to GDP ratio has been used to reflect financial development by previous study Easterly et al. (2000), Cecchetti, Flores – Lagunes and Krause (2006), Debrun et al. (2008) and Bugamelli and Paternó (2011) to examine the role of financial institution to stabilize economy. This measurement refers to financial resources provided to private sector by financial institution such as through loans, purchases of non – equity securities, and trade credits and others accounts receivable (World Bank, 2015). It is hypothesized that there is a negative relationship between total domestic credit to GDP ratio and output gap.

3.4.6 Economic Openness

Economic openness (OPN) represents to which extent an economy is integrated to international market. It is typically measured by total trade (export plus import) to GDP ratio. This indicator represents the amount of cross-border trade in goods and services in

a country. The greater total trade to GDP, the higher economic openness. It argues that trade openness makes an economy is more vulnerable to world demand and supply shocks that increases output volatility (Razin & Rose, 1992; Giovanni & Levchenko, 2008). Moreover, Verma and Verma (2014) argued that highly depending on external market causes a country heavily relies on foreign currency. A high fluctuation in foreign currency is likely to trigger uncertain foreign demanded on local output which in turn, induced more output volatility.

This measurement has been employed by Buch, Döpke and Strotmann (2006), Giovanni and Levchenko (2008) Ahmed and Suardi (2009) and, Bugamelli and Paternó (2011) and Fatima and Uma (2011) to examine the impact of economic openness on economy stability. These studies hypothesize that the relationship between economic openness and output gap is positive. It denotes that higher economic openness causes a high output fluctuation.

3.5 Sources of Data

Secondary data are utilized in this study based on a time series consisting of annual data for 33 years, from the period of 1981 – 2014. The sample of study covers five ASEAN countries namely, Malaysia, Singapore, Thailand, Indonesia and the Philippines. The justification of using time series analysis is that the ASEAN – 5 nations have heterogenous in all aspects particularly, in term of economic development and economic structures.

Thus, these countries would have different economic policies to stabilize economy against economic shocks (Nina & Anita, 2010; Doraisami, 2011).

Meanwhile, the data are obtained from various sources. For instance, GDP, lending rate, total trade (export and import) and total domestic credit are retrieved from World Bank website. Meanwhile fiscal policy data such as government expenditure, tax revenue and fiscal balances are available in annual publications of Key Indicator for Asia by ADB.

3.6 Method of Analysis

This section describes the method employed in analysing the data to achieve the objective of study. The study basically time series data analytical tools in attaining the sets goal of the research.

3.6.1 The Size of Shock Amplification and Shock Persistent

Since the first objective of the study focuses on economic resilience therefore, this study employs Equation [3.5] to obtain the size of shock amplification and shock persistent. This study utilizes ordinary least square (OLS) with robust standard error to obtain the size of shock amplification and shock persistent. This method devised by Newey and West (1987) which is also known as heteroskedasticity and autocorrelation consistent (HAC) standard error. Using OLS with HAC standard errors overcomes the negative consequences of heteroskedasticity and autocorrelation on the regression of Equation

[3.5]. To ignore the problem of autocorrelation and heteroskedasticity, the OLS estimation is no longer best but still a linear unbiased estimator. Moreover, the formula for standard errors computed for OLS estimation are no longer correct, and hence confidence intervals and hypothesis tests that use these standard errors may be misleading. To explain HAC, considered that linear regression model in matrix form as Equation[3.16].

[3.16] $Y = X\beta + u$

where;

$$Y = \begin{bmatrix} y_1 \\ y_2 \\ \vdots \\ y_T \end{bmatrix}, X = \begin{bmatrix} 1 & X_{11} & X_{12} & \cdots & X_{1t} \\ 1 & X_{21} & X_{22} & \dots & X_{2t} \\ \vdots & \vdots & \vdots & \ddots & \vdots \\ 1 & X_{k1} & X_{k2} & \cdots & X_{kt} \end{bmatrix}, \beta = \begin{bmatrix} \beta_1 \\ \beta_2 \\ \vdots \\ \beta_k \end{bmatrix} \text{ and } u = \begin{bmatrix} u_1 \\ u_2 \\ \vdots \\ u_t \end{bmatrix}$$

where t and k are the number of time period and the number of explanatory variables, respectively. Y is dependent variable, X is k – dimensional explanatory variables with coefficient vector, β and u is error term. The coefficient β can be consistently estimated by OLS estimation which is given as Equation [3.17].

[3.17] $\hat{\beta} = (X^T X)^{-1} X^T Y$

The OLS estimators in Equation [3.17] estimates $\hat{\beta}$ which are unbiased, consistent and asymptotically normally distributed. The covariance matrix for $\hat{\beta}$ is usually denoted by Equation [3.18] – Equation [3.19].

[3.18] $$\Psi = var[\hat{\beta}] = (X^T X)^{-1} X^T \Omega X (X^T X)^{-1}$$

[3.19] $$\Psi = var[\hat{\beta}] = (\frac{1}{T} X^T X)^{-1} \frac{1}{T} \Phi (\frac{1}{T} X^T X)^{-1}$$

where $\Phi = n^{-1} X^T \Omega X$. For inference in the linear regression model, it is crucial to have a consistent estimator for Ψ. What kind of estimator should be used for Ψ depends on assumption about Ω. In the classical linear model independent and homoscedastic error with variance σ^2 are assumed yielding $\Omega = \sigma^2 I_T$ and $\Psi = \sigma^2 (X^T X)^{-1}$ which can be consistently estimated by plugging $\hat{\sigma}^2 = (t-k)^{-1} \sum_{t=1}^{T} \hat{u}_t^2$. However, if classical linear model independent and homoscedastic is violated, the inference of consistent $\Psi = \sigma^2 (X^T X)^{-1}$ will be biased. Heteroskedasticity consistent (HC) and HAC by plugging an estimate $\widehat{\Omega}$ or $\widehat{\Psi}$ into Equation [3.19] which are consistent in the presence of heteroskedasticity and autocorrelation.

For the case of heteroskedasticity, it is assumed that errors u_t are independent but potentially not constant. This problem causes covariance matrix Ω is diagonal but has nonconstant diagonal elements. Therefore, various HC estimators, Ψ_{HC} have been suggested which are constructed by plugging an estimate of type $\widehat{\Omega} = diag(\omega_1, \ldots, \omega_n)$ into Equation [3.19] (see Mackinnon & White (1985)).

Meanwhile, the problem of autocorrelation is due to u_t which are not independent and causes covariance matrix Ω is no longer diagonal. A solution to this problem is to estimate

Φ which is given as Equation [3.20]. The HAC estimator, $\widehat{\Psi}_{HAC}$ is computed by plugging estimated $\widehat{\Phi}$ in Equation [3.19].

[3.20] $$\widehat{\Phi} = \frac{1}{T}\sum_{t,j}^{T} \omega_{|t-j|}\, \hat{V}_t \hat{V}_j^{\,T}$$

where $\hat{V}_t = x_t(y_i - x_i^T\beta)$ and $\omega = (\omega_0, \ldots, \omega_{n-1})^T$ are vector of weights. In Equation [3.20], it implies that autocorrelation should decrease with the increasing of lag $\ell = |t-j|$. The choice for the vector of weight, ω have been suggested by Newey and West (1987) in general framework of kernel function with automatic bandwidth selection. With the appropriate the automatic choice of vector of weight, ω, $\widehat{\Psi}_{HAC}$ can be estimated to obtain robust standard error for the estimation on Equation [3.5].

Other issues that must be highlighted in OLS analysis is the stationarity of data series. Obtaining significant regression results from related data could be false when the non-stationary of data series is used in regression analysis. In fact, the non – stationary series does not have a constant mean which causes the data series used in regression have nothing in common to be related among them. This problem is known as spurious regression. Therefore, the stationarity of data should be determined before performing OLS estimation in order to avoid spurious regression. Unit root test can determine the stationarity of data series used in this study.

In this respect, unit roots test actually based on AR(1) process where it refers that each realization of a variable, y_t contains a proportion of ρ of last period's value y_{t-1} plus an error term, v_t. The AR (1) process is given in Equation [3.24]:

[3.21] $y_t = \alpha + \rho y_{t-1} + v_t$

where;

y_t = random variable at time, t

y_{t-1} = random variable at time, $t-1$

v_t = error term

Equation [3.21] indicates that v_t is independent random errors with zero mean and constant variance σ_v^2. When $|\rho| < 1$, Equation [3.21] is stationary. In contrast, $|\rho| = 1$ indicates that Equation [3.21] has unit root and becomes nonstationary where it follows random walk process which is given in Equation [3.22].

[3.22] $y_t = \alpha + y_{t-1} + v_t$

For a convenient unit root testing, Equation [3.21] is subtracted by y_{t-1} from both side which produces Equation [3.23].

[3.23] $\Delta y_t = \gamma y_{t-1} + v_t$

where, $\gamma = \rho - 1$. The hypothesis can be written as following in term of γ or ρ:

$H_0: \rho = 1 \Leftrightarrow H_0: \gamma = 0$

$H_1: \rho < 1 \Leftrightarrow H_1: \gamma < 0$

Fails to reject the null hypothesis, H_0 of unit root in output gap series at level against the alternate hypothesis, H_1 indicates that output gap series is stationary which validates the presence of shocks persistent. In general, an AR(p) model includes lags of y_t up to y_{t-p}. In this study, Augmented Dickey Fuller (ADF) and Phillips – Perron (PP) unit root test are employed to ensure to ensure to consistency of unit root test result. ADF parametrically corrects for higher order in AR process where this technique extents Equation [3.23] as Equation [3.24].

[3.24] $\Delta y_t = \gamma y_{t-1} + \sum_{s=1}^{m} a_s \Delta y_{t-s} + v_t$

where s is number of first different lags included. This ADF unit root test allows the possibility of autocorrelated error terms. The appropriate first different lags are added in Equation [3.24] to ensure that error term is uncorrelated which in turn, it eliminates autocorrelation in error. This study utilizes Akaike lag selection criteria (AIC) to obtain a suitable number of first different lags to be included in Equation [3.24].

PP unit root test, on other hand, applies non – parametrically correction for any serial correlation and heteroskedasticity in error term of ADF unit root test. One advantage of PP test over ADF test is that PP test are more robust to general forms of heteroskedasticity

in error term and unknown order autocorrelation. Moreover, t – statistic of PP will have the same asymptotic distribution as t – statistics of ADF test by using Newey – West covariance estimator bandwidth selection (Greene, 2002).

The data series which are identified by ADF and PP unit root tests as non - stationary will be taking first difference thereby, turn the data series into stationary before OLS with robust standard error estimation. By means of this estimation, the model in Equation [3.5] are varied for each individual country which are shown in the Equation [3.25] – Equation[3.29].

[3.25] $$LGAP_{Mt} = \alpha_M + \varphi LGAP_{Mt-1} + \lambda CRS_t + \theta(CRS_t{}^* GSZ_{Mt}) + \varepsilon_{Mt}$$

[3.26] $$LGAP_{St} = \alpha_S + \varphi LGAP_{St-1} + \lambda CRS_t + \theta(CRS_t{}^* GSZ_{St}) + \varepsilon_{St}$$

[3.27] $$LGAP_{Tt} = \alpha_T + \varphi LGAP_{Tt-1} + \lambda CRS_t + \theta(CRS_t{}^* GSZ_{Tt}) + \varepsilon_{Tt}$$

[3.28] $$LGAP_{It} = \alpha_I + \varphi LGAP_{It-1} + \lambda CRS_t + \theta(CRS_t{}^* GSZ_{It}) + \varepsilon_{It}$$

[3.29] $$LGAP_{Pt} = \alpha_P + \varphi LGAP_{Pt-1} + \lambda CRS_t + \theta(CRS_t{}^* GSZ_{Pt}) + \varepsilon_{Pt}$$

where the subscripts of M, S, T, P and I represents Malaysia, Singapore, Thailand, the Philippines and Indonesia, respectively. In these equations, the sizes of shock amplification can be captured by Equation [3.30].

[3.30] $\gamma = \frac{\theta}{\lambda}$

For the sizes of shock persistent, they are captured by φ which pertain AR(1) process of output gap in Equation [3.25] – [3.29].

3.6.2 The Effect of Fiscal Policy on The Business Cycle

This study incorporates Autoregressive Distributed Lag (ARDL) analysis to investigate the effect of fiscal policy on business cycle in the ASEAN – 5 countries which is stated in the second and third objective of the study. This method was proposed by Pesaran and Shin (1995) which subsequently extended by Pesaran, Shin and Smith (2001).

The ARDL approach has the advantage of yielding consistent estimates of the long run coefficient that are asymptotically normal irrespective of whether the underlying regressor are I(0) or I(1) (Pesaran & Shin, 1995). Consequently, ARDL cointegration technique is preferable when dealing with variables that are integrated order, I(0), I(1) or mutually cointegrated where pre – test of unit root test is not required in this technique (Pesaran, Shin & Smith, 2001). Moreover, it can eliminate the problem of endogeneity by using enough lag in the estimations.

In this regard, ARDL model relies on the sufficient numbers of lags to capture the data generating process in a general – to – specific modelling framework. The ARDL analysis estimates $(p+1)^j$ number of regressions in order to obtain the optimal lags, k for each

variable in the models, where p is the maximum numbers of lags to be used and j is the number of variables in these Equations. The optimal number of lags can be selected by using AIC. The ARDL framework for model in the Equation [3.8] and the Equation [3.7] for each the ASEAN – 5 countries are modified as Equation [3.31] and Equation [3.32], respectively.

$$[3.31]\ \Delta LGAP_t = \alpha_0 + \sum_{k=1}^{p} \alpha_{1k}\, \Delta LGAP_{t-k} + \sum_{k=1}^{p} \alpha_{2k}\, \Delta LGSZ_{t-k} + \sum_{k=1}^{p} \alpha_{3k}\, \Delta LINT_{t-k} + \sum_{k=1}^{p} \alpha_{4k} \Delta\, LCRDT_{\,t-k} + \sum_{k=1}^{p} \alpha_{5k}\, \Delta LOPN_t + \beta_1 LGAP_{t-1} + \beta_2 LGSZ_{t-1} + \beta_3 LINT_{t-1} + \beta_4 LCRDT_{t-1} + \beta_5 LOPN_{t-1} + \varepsilon_t$$

$$[3.32]\ \Delta LGAP_t = \delta_0 + \sum_{k=1}^{p} \delta_{1k}\, \Delta LGAP_{t-k} + \sum_{k=1}^{p} \delta_{2k}\, \Delta LCAB_{t-k} + \sum_{k=1}^{p} \delta_{3k}\, \Delta LINT_{t-k} + \sum_{k=1}^{p} \delta_4\, \Delta LCRDT_{\,t-k} + \sum_{k=1}^{p} \delta_5 \Delta\, LOPN_t + \beta_1 LGAP_{t-1} + \beta_2 LCAB_{t-1} + \beta_3 LINT_{t-1} + \beta_4 LCRDT_{t-1} + \beta_5 LOPN_{t-1} + \varepsilon_t$$

where

Δ = first difference operator

The established long – run relationship in the Equation [3.31] and Equation [3.32] can be detected by using Bound test method. This method is based upon joint F – statistics on null hypothesis $H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 = 0$ and versus alternate hypothesis $H_0: \beta_1 = \beta_2 = \beta_3 = \beta_4 = \beta_5 \neq 0$ in these equations. If the calculated F – statistics is greater than the upper critical value then, the null hypothesis is rejected which it indicates the existence of the long – run relationship. In contrast, if F – statistics is below than the lower critical value, the long – run relationship in the models does not exist. On the other

hand, if the *F* – statistics fall between upper bound and lower bound thereby, the existent of long – run relationship in the models are indecisive. Once the existence of long run – run relationship is verified, the long – run ARDL model of automatic stabilizers and discretionary fiscal for each the ASEAN – 5 countries can be given as Equation [3.33] and Equation [3.34].

[3.33] $$\vartheta_0 + \vartheta_1 LGAP_1 + \vartheta_2 LGSZ_t + \vartheta_3 LINT_t + \vartheta_4 LCRDT_t + \vartheta_5 LOPN_t = 0$$

[3.34] $$\sigma_0 + \sigma_1 LGAP_1 + \sigma_2 LCAB_t + \sigma_3 LINT_t + \sigma_4 LCRDT_t + \sigma_5 LOPN_t = 0$$

By normalizing $LGAP_1$ in Equation [3.33] and Equation [3.34] to one, the long – run equilibrium relationship can be expressed into Equation [3.35] and Equation [3.36].

[3.35] $$LGAP_1 = \alpha_1 + \alpha_2 LGSZ_t + \alpha_3 LINT_t + \alpha_4 LCRDT_t + \alpha_5 LOPN_t$$

[3.36] $$LGAP_1 = \theta_1 + \theta_2 LCAB_t + \theta_3 LINT_t + \theta_4 LCRDT_t + \theta_5 LOPN_t$$

where

$$\alpha_1 = -\frac{\vartheta_0}{\vartheta_1}$$

$$\alpha_2 = -\frac{\vartheta_2}{\beta_1}$$

$$\alpha_3 = -\frac{\vartheta_3}{\vartheta_1}$$

$$\alpha_4 = -\frac{\vartheta_4}{\vartheta_1}$$

$$\alpha_5 = -\frac{\vartheta_5}{\vartheta_1}$$

and,

$$\theta_1 = -\frac{\sigma_0}{\sigma_1}$$

$$\theta_2 = -\frac{\sigma_2}{\sigma_1}$$

$$\theta_3 = -\frac{\sigma_3}{\sigma_1}$$

$$\theta_4 = -\frac{\sigma_4}{\sigma_1}$$

$$\theta_5 = -\frac{\sigma_5}{\sigma_1}$$

Due to normalizing process, the signs in Equation [3.35] and Equation [3.36] are reversed to enable proper interpretation. The impact of automatic stabilizers and discretionary fiscal on business cycle are captured by α_2 and θ_2 in these equations, respectively.

Also, the ARDL model can estimate the short run dynamic relationship between output fluctuation and fiscal tools. The short run ARDL model of automatic stabilizer and discretionary fiscal are shown in Equation [3.37] and Equation [3.38].

[3.37] $$\Delta LGAP_t = \delta_0 + \sum_{k=1}^{p} \Delta\delta_{1k} LGAP_{t-k} + \sum_{k=1}^{p} \Delta\delta_{2k} LGSZ_{t-k} + \sum_{k=1}^{p} \Delta\delta_{3k} LINT_{t-k} + \sum_{k=1}^{p} \Delta\delta_{4k} LCRDT_{t-k} + \sum_{k=1}^{p} \Delta\delta_{5k} LOPN_t + \lambda ECT_{t-k} + \varepsilon_t$$

[3.38] $$\Delta LGAP_t = \delta_0 + \sum_{k=1}^{p} \Delta\delta_{1k} LGAP_{t-k} + \sum_{k=1}^{p} \Delta\delta_{2k} LCAB_{t-k} + \sum_{k=1}^{p} \Delta\delta_{3k} LINT_{t-k} + \sum_{k=1}^{p} \Delta\delta_{4k} LCRDT_{t-k} + \sum_{k=1}^{p} \Delta\delta_{5k} LOPN_t + \lambda ECT_{t-k} + \varepsilon_t$$

where

ECT = Error correction term

ECT in Equation [3.37] and Equation [3.38] are obtained from the residual of estimated cointegration in Equation [3.33] and Equation [3.34], respectively. The coefficient of λ represents to which extent the disequilibria of $LGAP_t$ is corrected toward the long run equilibrium in one year. Meanwhile, the coefficient of $\delta_{1k} - \delta_{5k}$ in Equation [3.37] and Equation [3.38] represent the short run coefficient of explanatory variables.

To ensure that the estimation results are free from spurious inference, the competency of the specified ARDL models are verified via diagnostic tests. In this section, the problem of autocorrelation is examined by using Breusch – Godfrey Serial Correlation LM test. To test the strength and stability of the models, Cumulative Sum of Recursive Residual Square (CUSUMSQ) test is applied as diagnostic checking.

3.6.3 The Effectiveness of Fiscal Tools on Economic Resilience

Debrun and Kapoor (2010) argued that the effectiveness of fiscal tools can be deduced from the sign of estimated coefficient α_2 in Equation [3.35] and θ_2 in Equation [3.36]. The estimated coefficient α_2 and θ_2 actually represents the response of fiscal policy regardless during economic crisis or normal time. Hence, α_2 and θ_2 should be compared with the estimated coefficients that captures the impact of fiscal tools during economic crisis. If the estimated coefficients show a stronger countercycle than α_2 and θ_2, fiscal tools are considered as effective during economic crisis. To obtain coefficients that

captures the impact of fiscal tools during economic crisis, Equation [3.35] and Equation[3.36] are modified into conditional ARDL error – correction model. The conditional ARDL error – correction model can be represented as Equation [3.39] – Equation [3.42].

$$[3.39]\quad \Delta LGAP_t = \gamma_0 + \gamma_1 D_{AFC} + \gamma_2 LGAP_{t-1} + \gamma_3 LGSZ_{t-1} + \gamma_4 LINT_{t-1} + \gamma_5 LCRDT_{t-1} + \gamma_6 LOPN_{t-1} + \sum_{k=1}^{p} \omega_{1k} \Delta LGAP_{t-k} + \sum_{k=1}^{p} \varphi_{2k} \Delta LGSZ_{t-k} + \sum_{k=1}^{p} \tau_{3k} \Delta LINT_{t-k} + \sum_{k=1}^{p} \pi_{4k} \Delta LCRDT_{t-k} + \sum_{k=1}^{p} \mu_{5k} \Delta LOPN_{t-k} + \sum_{k=1}^{p} \vartheta_{6k} (D_{AFC}{}^{*} \Delta LGSZ_{t-k}) + \varepsilon_t$$

$$[3.40]\ \Delta LGAP_t = \rho_0 + \rho_1 D_{AFC} + \rho_2 LGAP_{t-1} + \rho_3 LCAB_{t-1} + \rho_4 LINT_{t-1} + \rho_5 LCRDT_{t-1} + \rho_6 LOPN_{t-1} + \sum_{k=1}^{p} \omega_{1k} \Delta LGAP_{t-k} + \sum_{k=1}^{p} \varphi_{2k} \Delta LGSZ_{t-k} + \sum_{k=1}^{p} \tau_{3k} \Delta LINT_{t-k} + \sum_{k=1}^{p} \pi_{4k} \Delta LCRDT_{t-k} + \sum_{k=1}^{p} \mu_{5k} \Delta LOPN_{t-k} + \sum_{k=1}^{p} \vartheta_{6k} (D_{AFC}{}^{*} \Delta LCAB_{t-k}) + \varepsilon_t$$

$$[3.41]\quad \Delta LGAP_t = \gamma_0 + \gamma_1 D_{GFC} + \gamma_2 LGAP_{t-1} + \gamma_3 LGSZ_{t-1} + \gamma_4 LINT_{t-1} + \gamma_5 LCRDT_{t-1} + \gamma_6 LOPN_{t-1} + \sum_{k=1}^{p} \omega_{1k} \Delta LGAP_{t-k} + \sum_{k=1}^{p} \varphi_{2k} \Delta LGSZ_{t-k} + \sum_{k=1}^{p} \tau_{3k} \Delta LINT_{t-k} + \sum_{k=1}^{p} \pi_{4k} \Delta LCRDT_{t-k} + \sum_{k=1}^{p} \mu_{5k} \Delta LOPN_{t-k} + \sum_{k=1}^{p} \vartheta_{6k} (D_{GFC}{}^{*} \Delta LGSZ_{t-k}) + \varepsilon_t$$

$$[3.42]\quad \Delta LGAP_t = \rho_0 + \rho_1 D_{GFC} + \rho_2 LGAP_{t-1} + \rho_3 LCAB_{t-1} + \rho_4 LINT_{t-1} + \rho_5 LCRDT_{t-1} + \rho_6 LOPN_{t-1} + \sum_{k=1}^{p} \omega_{1k} \Delta LGAP_{t-k} +$$

$$\sum_{k=1}^{p} \varphi_{2k} \Delta LGSZ_{t-k} + \sum_{k=1}^{p} \tau_{3k} \Delta LINT_{t-k} + \sum_{k=1}^{p} \pi_{4k} \Delta LCRDT_{t-k} +$$

$$\sum_{k=1}^{p} \mu_{5k} \Delta LOPN_{t-k} + \sum_{k=1}^{p} \vartheta_{6k} (D_{GFC}{}^{*} \Delta LCAB_{t-k}) + \varepsilon_t$$

where,

D_{AFC} = Dummy variable for AFC (1 is during AFC period and 0 is not AFC period)

D_{GFC} = Dummy variable for GFC (1 is during GFC period and 0 is not GFC period)

ARDL Conditional error – correction models in Equation [3.39] and Equation [3.40] describe the response of automatic stabilizers and discretionary fiscal on economic resilience during AFC. These equations control the response of automatic stabilizer and discretionary fiscal during AFC which is captured by the interaction term of $D_{AFC}{}^{*}\Delta LGSZ_{t-k}$ and $D_{AFC}{}^{*}\Delta LCAB_{t-k}$. Meanwhile, ARDL models that represent the response of automatic stabilizers and discretionary fiscal on economic resilience during GFC are shown in Equation [3.41] and Equation [3.42]. The response of automatic stabilizer and discretionary fiscal during GFC is captured by the interaction term of $D_{GFC}{}^{*}\Delta LGSZ_{t-k}$ and $D_{GFC}{}^{*}\Delta LCAB_{t-k}$. The estimated long – run equilibrium for Equation [3.39] – Equation [3.40] can be expressed as Equation [3.43] – Equation [3.46].

[3.43] $$\eta_0 + \eta_1 LGAP_t + \eta_2 LGSZ_t + \eta_3 LINT_t + \eta_4 LCRDT_t + \eta_5 LOPN_t = 0$$

[3.44] $$\psi_0 + \gamma LGAP_t + \psi_2 LCAB_t + \psi_3 LINT_t + \psi_4 LCRDT_t + \psi_5 LOPN_t = 0$$

[3.45] $$\eta_0 + \eta_1 LGAP_t + \eta_2 LGSZ_t + \eta_3 LINT_t + \eta_4 LCRDT_t + \eta_5 LOPN_t = 0$$

[3.46] $\psi_0 + \psi_1 LGAP_t + \psi_2 LCAB_t + \psi_3 LINT_t + \psi_4 LCRDT_t + \psi_5 LOPN_t = 0$

Equation [3.43] – Equation [3.46] can be transformed into Equation [3.47] – Equation [3.50] after normalizing $LGAP_t$ into one.

[3.47] $LGAP_1 = \phi_0 + \phi_1 LGSZ_t + \phi_2 LINT_t + \phi_3 LCRDT_t + \phi_4 LOPN_t$

[3.48] $LGAP_1 = \pi_0 + \pi_1 LCAB_t + \pi_2 LINT_t + \pi_3 LCRDT_t + \pi_4 LOPN_t$

[3.49] $LGAP_1 = \phi_0 + \phi_1 LGSZ_t + \phi_2 LINT_t + \phi_3 LCRDT_t + \phi LOPN_t$

[3.50] $LGAP_1 = \pi_0 + \pi_1 LCAB_t + \pi_2 LINT_t + \pi_3 LCRDT_t + \pi_4 LOPN_t$

where

$\phi_1 = -\frac{\eta_0}{\eta_1}$

$\phi_2 = -\frac{\eta_2}{\eta_1}$

$\phi_3 = -\frac{\eta_3}{\eta_1}$

$\phi_4 = -\frac{\eta_4}{\rho_1}$

$\phi_5 = -\frac{\eta_5}{\eta_1}$

and,

$\pi_1 = -\frac{\psi_0}{\psi_1}$

$$\pi_2 = -\frac{\psi_2}{\psi_1}$$

$$\pi_3 = -\frac{\psi_3}{\gamma_1}$$

$$\pi_4 = -\frac{\psi_4}{\psi_1}$$

$$\pi_5 = -\frac{\psi_5}{\psi_1}$$

Based on Equation [3.47] and Equation [3.49], the response of automatic stabilizers can be captured by ϕ_2 during AFC and GFC. The coefficient π_2 in Equation [3.48] and Equation [3.50] reflects the response of discretionary fiscal during AFC and GFC. By comparing the estimated coefficient α_2 and θ_2 in Equation [3.35] and Equation [3.36] with ϕ_2 and π_2, the effectiveness of fiscal policy can be determined. If the coefficient ϕ_2 is less than α_2 and significance at any level therefore, it signifies that the impact of automatic stabilizers to stabilize output fluctuation during crisis is greater. The fiscal tools can be considered as effective during crisis. Thus, fiscal tools are appeared to be effective on dampening output fluctuation during economic shock. Similarly, discretionary fiscal is considered to be effective as π_2 is less than θ_2 and significance at any level. In contrast, automatic stabilizers tool is not effective when the value of ϕ_2 is higher than $\alpha_2$or insignificant at any level whereas, the value of π_2 that is greater than θ_2 reflects discretionary fiscal is not effective during economic crisis.

3.7 Conclusion

The econometric procedure in this chapter was explained systematically in examining the effect of fiscal policy on economic resilience. To examine the resiliency of ASEAN-5 countries to shocks, OLS estimation with robust standard error is employed to determine shock amplification and shock persistent. Meanwhile, ARDL is used to examine the effect of fiscal tools on the business cycle and to investigate the effectiveness of fiscal policy on economic resilience as stated in second and third objective.

CHAPTER FOUR

DISCUSSION OF RESULTS

4.1 Introduction

This chapter consists of six sections including the introduction. Section 4.2 is descriptive analysis that describes the attributes of data in the study. The correlation analysis is presented in Section 4.2. Section 4.3 is devoted to the measurement of economic resilience, while Section 4.4 discusses the estimated results of the effect of fiscal policy on economic resilience. Section 4.5 contains the result of analysis on the effectiveness of fiscal policy on economic resilient. Finally, Section 4.6 provides the summary of this chapter.

4.2 Descriptive Analysis

This section provides the explanation about the behaviour and reliability of employed data in this study. Table 4.1 shows the summary of statistics for GDP gap to potential GDP ratio (*LGAP*), government expenditure to GDP ratio (*LGSZ*), cyclical adjusted balanced *(LCAB)*, total domestic credit to GDP ratio (*LCRDT*), total trade to GDP ratio (*LOPN*) and lending rate (*LRTE*) of ASEAN – 5 countries. The table shows average, minimum, maximum and standard deviations of the ASEAN – 5 countries over 33 years, 1981 – 2014.

From Table 4.1, the ASEAN – 5 countries have the mean value of *LGAP* lower than the value of average mean which is 1.34 percent, except Indonesia. It signifies that aggregate output of these countries did not fluctuate much from potential output. Meanwhile, Indonesia has the highest value of *LGAP* which indicates that this country experienced a higher and longer output fluctuation compared to other countries. Since the standard deviations of *LGAP* are lower than the mean values of *LGAP* for each the ASEAN – 5 countries, it indicates that the values of *LGAP* for the ASEAN – 5 countries are not largely dispersed from their mean value.

Meanwhile, the mean values of *LGSZ* of the ASEAN – 5 countries, except Malaysia are less than the value of average mean which is 1.29 percent. It implies that the size of government which is reflected automatic stabilizers tool in these countries are small. In contrast, Malaysia tends to utilize automatic stabilizer as this country has the highest mean value of *LGSZ*. For discretionary fiscal tools, the mean values of *LCAB* of Malaysia and Thailand are higher than the average of mean value, 2.1 percent. Thus, Malaysia and Thailand have more sizeable fiscal discretionary tools compared to other countries to counteract with shocks.

Table 4.1
Descriptive Analysis of Variables, 1981 – 2014

Variable	Country	Mean	Standard Deviation	Minimum	Maximum
LGAP	Malaysia	1.21	0.30	0.38	1.71
	Singapore	1.31	0.33	0.38	1.73
	Thailand	1.28	0.35	0.28	1.81
	Philippines	1.23	0.26	0.55	1.65
	Indonesia	1.67	0.18	0.99	2.00
	Average	1.34	0.28	2.58	1.78
LGSZ	Malaysia	1.43	0.07	1.33	1.64
	Singapore	1.26	0.16	0.58	1.55
	Thailand	1.25	0.06	1.14	1.38
	Philippines	1.26	0.16	1.12	1.38
	Indonesia	1.27	0.05	1.18	1.37
	Average	1.29	0.10	1.07	1.46
LCAB	Malaysia	2.21	0.66	-0.95	2.68
	Singapore	2.09	0.41	0.42	2.60
	Thailand	2.25	0.37	0.46	2.58
	Philippines	1.98	0.37	0.81	2.40
	Indonesia	1.97	0.54	-0.38	2.47
	Average	2.10	0.47	0.07	2.55
LCRDT	Malaysia	1.46	0.11	1.76	2.20
	Singapore	1.97	0.06	1.88	2.12
	Thailand	1.97	0.16	1.62	2.22
	Philippines	1.46	0.14	1.17	1.75
	Indonesia	1.47	0.19	1.06	1.78
	Average	1.67	0.13	1.50	2.01
LOPN	Malaysia	2.20	0.10	2.02	2.34
	Singapore	2.55	0.04	2.47	2.65
	Thailand	1.96	0.16	1.68	2.15
	Philippines	1.85	0.12	1.66	2.03
	Indonesia	1.73	0.07	1.60	1.98
	Average	2.06	0.10	1.89	2.23
LRTE	Malaysia	0.86	0.13	0.66	1.08
	Singapore	0.76	0.05	0.72	0.88
	Thailand	0.95	0.15	0.74	1.19
	Philippines	1.06	0.18	0.74	1.38
	Indonesia	1.25	0.12	1.07	1.07
	Average	0.98	0.13	0.79	1.12

Furthermore, the mean values of *LOPN* for Singapore and Malaysia are the highest in the ASEAN – 5 countries. It is consistent with the facts that Malaysia and Singapore are highly dependence on international market. Table 4.1 further reveals that mean values of *LCRDT* for Singapore and Thailand are greater than the value of average mean. These values imply that financial markets of both countries were highly developed compared to other ASEAN – 5 countries.

Also, Table 4.1 exhibits that mean values of *LRATE* for ASEAN – 5 countries, except Indonesia are less than the value of average mean. These values signify that lending rates as monetary policy tool are set at low rate in order to reduce cost of borrowing and encourage more investment level. In contrast, mean value of *LRATE* for Indonesia is much higher than other ASEAN – 5 countries which indicates that lending rates is set at high rate.

4.3 Correlation Analysis

Table 4.2 presents correlation coefficient for each pair of variables in the ASEAN – 5 countries over the sample period. The correlation matrix for Malaysia indicates that there is a moderate and negative correlation between *LGAP* and *LGSZ* as the magnitude of the correlation is low. It implies that automatic stabilizer negatively associates with output fluctuation where output gap tends to decrease as automatic stabilizers is increasing. Thus, automatic stabilizer can be considered as countercycle response. However, there is a strong and negative correlation between *LGAP* and *LCAB* since the correlation value is

greater than 0.5. The correlation can be deduced that discretionary fiscal tools increases as output gap is decreasing. Therefore, the behaviour of discretionary is countercycle response. Both *LOPN* and *LCRDT* with *LGAP* have weak positive with *LGAP* correlations which are around 0.2. For the variable of *LINT*, its correlation with *LGAP* is weak and negative suggesting that monetary policy is countercycle response.

Table 4.2
Correlation Matrix of the Variables

Country	Variable	*LGAP*	*LGSZ*	*LCAB*	*LOPN*	*LCRDT*
Malaysia	*LGAP*	1.000	-	-	-	-
	LGSZ	-0.478*	1.000	-	-	
	LCAB	-0.718*	0.056*	1.000	-	-
	LOPN	0.272**	-0.605	-0.305	1.000	-
	LCRDT	0.198*	0.073*	0.514*	0.568	1.000
	LINT	-0.137*	0.045	-0.172	0.015	0.033
Singapore	*LGAP*	1.000	-	-	-	-
	LGSZ	-0.428*	1.000	-	-	-
	LCAB	-0.598*	0.001	1.000	-	-
	LOPN	0.380*	-0.429*	0.123	1.000	-
	LCRDT	0.217	0.554*	0.058	0.263	1.000
	LINT	0.099	0.476*	-0.493*	-0.497*	-0.423*
Thailand	*LGAP*	1.000	-	-	-	-
	LGSZ	-0.355*	1.000	-	-	-
	LCAB	0.242	0.113	1.000	-	-
	LOPN	0.251*	0.265	-0.040	1.000	-
	LCRDT	0.318**	0.325	-0.349*	0.037*	1.000
	LINT	0.224	-0.261	-0.142	-0.265*	-0.415*
Indonesia	*LGAP*	1.000	-	-	-	-
	LGSZ	-0.331*	1.000	-	-	-
	LCAB	-0.324*	0.255	1.000	-	-
	LOPN	0.115*	0.221	-0.067	1.000	-
	LCRDT	0.128	-0.401*	-0.432*	-0.021	1.000
	LINT	-0.408*	0.239	-0.007	0.338*	0.303
Philippines	*LGAP*	1.000	-	-	-	-
	LGSZ	-0.080*	1.000	-	-	-
	LCAB	-0.375*	-0.119	1.000	-	-
	LOPN	0.079	0.089	0.177	1.000	-
	LCRDT	0.510*	-0.390*	-0.122	0.414*	1.000
	LINT	-0.075	0.254	-0.318*	-0.366*	-0.409*

Note: * and ** represent significance at 5 and 10 percent, respectively.

Similarly, the discretionary fiscal and automatic stabilizers tools for Singapore are moderate countercycle response as the value of correlations are between 0.4 – 0.6 and negative. *LOPN* has weak positive correlation with *LGAP* which reflects economic openness is procycle response but the magnitude of correlation is weak. The rest of variables, *LCRDT* and *LINT* are found to be insignificant correlated with *LGAP*.

Meanwhile, the correlation of *LCAB* with *LGAP* for Thailand suggested that automatic stabilizers tool is weakly countercycle. In contrast, *LCAB* is insignificant to be correlated with *LGAP* revealing that discretionary fiscal in Thailand is neither countercycle or procycle. *LOPN* and *LCRDT* are appeared to be weakly procycle as the value of correlations around 0.3. *LINT* is found to be insignificant correlated with *LGAP*.

Moreover, the degree of correlations for *LCAB* and *LGSZ* for Indonesia are around - 0.3. It reflects automatic stabilizer and discretionary fiscal tools are countercycle. Similar to other the ASEAN - 5 countries, the correlation value for *LOPN* with *LGAP* is positive meaning that trade openness is procycle behaviour. Meanwhile, a small and negative correlation value of *LINT* suggests that monetary policy is countercycle. However, *LCDT* is insignificant correlated with *LGAP* which can be deduced that financial development is neither countercycle or procycle.

For the Philippines, the magnitude of correlation of *LCAB* and *LGSZ* with *LGAP* are negative. Thus, automatic stabilizer and discretionary fiscal tools in this country are countercycle. Financial development is strongly procycle where the value of *LCRDT*

negatively correlates with *LGAP* and its magnitude around 0.5. For the rest of variable, *LOPN* and *LINT* are insignificant to correlate with *LGAP*.

4.4 Unit Root Test for OLS Analysis

Unit root test is utilized to determine the stationarity of data series in this study. There are two main reasons to conduct unit root test as preliminary test. First, all variables must be stationary at level to avoid the problem of spurious regression in OLS estimation. Second, this test gives insight on stationarity of variables before conducting ARDL analysis either these variables are stationary at level, stationary at first difference or mixed. Table 4.3 present the result of ADF unit root test for each the ASEAN – 5 countries.

ADF unit root test results of Malaysia and Thailand reveals that the hypothesis of non – stationary is rejected for *LGAP*, *LCAB* and *CRS*LGSZ* at level. This result is implies that both variables are stationary at level or integrated with order of zero, I(0). Meanwhile, unit test result show that the hypothesis of non – stationary for *LGSZ*, *LOPN*, *LCRDT* and *LINT* are rejected after taking first difference. Therefore, these series are considered cointegrated with order of 1, I(1). Furthermore, ADF unit root test suggests that the series of *LGSZ*, *LOPN*, *LRCDT* and *CRS*LGSZ* are I(0) for Singapore because the hypothesis of non – stationary is rejected at level. In contrast, the variables of *LGAP*, *LCAB* and *LINT* are found to be stationary as the hypothesis of non – stationary is rejected at first difference.

Table 4.3

The Result of ADF Unit Root Test for Time Series Data

Country	Variable	ADF			
		Constant		Constant + Intercept	
		Level	First Difference	Level	First Difference
Malaysia	*LGAP*	-3.650[0]*	-	-3.668[0]*	-
	LGSZ	-2.370[2]	-5.677[0]*	-2.410[0]	-5.930[0]*
	LCAB	-9.295[0]*	-	-8.555[0]*	-
	LOPN	-2.610[4]	-3.439[7]*	-2.610[4]	-3.678[2]*
	LCRDT	-2.462[0]	-5.143[0]*	-2.108[0]	-4.673[1]*
	LINT	-0.527[0]	-4.388[0]*	-2.735[1]	-4.376[0]*
	*CRS*LGSZ*	-3.342[1]*	-	-4.589[8]*	-
Singapore	*LGAP*	-3.232[1]8*	-	-3.443[1]**	-
	LGSZ	0.229[0]	-3.356[0]*	-1.772[0]	-3.546[0]**
	LCAB	-3.854[0]*	-	-3.834[0]**	-
	LOPN	-2.110[0]	-5.709[0]*	-3.154[1]	-5.633[0]*
	LCRDT	-0.648[0]	-4.003[8]*	-1.663[1]	-3.885[8]**
	LINT	-4.220[0]*	-	-3.219[1]*	-
	*CRS*LGSZ*	-3.332[0]*	-	-3.400[0]**	-
Thailand	*LGAP*	-3.698[0]*	-	-3.625[0]*	-
	LGSZ	-2.601[0]	-5.530[1]*	-3.067[0]	-5.520[1]*
	LCAB	-3.415[0]*	-	-3.366[0]*	-
	LOPN	-1.881[2]	-4.511[1]*	-1.497[0]*	-4.896[0]*
	LCRDT	-2.027[1]	-3.082[0]*	-2.162[1]	3.561[0]*
	LINT	-1.314[0]	-4.646[0]*	-2.757[0]	-4.597[0]*
	*CRS*LGSZ*	-3.816[0]*	-	-4.033[0]*	-
Philippines	*LGAP*	-2.785[0]	-5.873[0]*	-2.787[0]	-5.834[0]*
	LGSZ	-2.389[1]	-4.539[0]*	-2.026[0]	-4.662[0]*
	LCAB	-3.415[0]*	-	-3.366[0]*	-
	LOPN	-1.881[2]	-4.511[1]*	-1.497[0]	-4.890[1]*
	LCRDT	-2.027[1]	-3.082[0]*	-2.162[1]	-3.212[0]**
	LINT	-1.314[0]	-4.646[0]*	-2.757[1]	-4.597[0]*
	*CRS*LGSZ*	-3.869[0]*	-	-3.842[0]*	-
Indonesia	*LGAP*	-5.065[0]*	-	-4.981[0]*	-
	LGSZ	-3.478[0]*	-	-3.785[0]*	-
	LCAB	-4.223[0]*	-	-4.162[0]*	-
	LOPN	-1.996[1]	-8.249[0]*	-2.868[0]	-8.170[0]*
	LCRDT	-2.184[1]	-4.265[0]*	-2.109[1]	-4.240[0]*
	LINT	0.559[2]	-5.503[1]*	-2.580[3]	-5.437[1]*
	*CRS*LGSZ*	-5.761[0]*	-	-5.674[0]*	-

Note: a) * and ** indicates rejection of the null hypothesis at five percent and 10 percent significant level

b) numbers in bracket represent the lags included in ADF test

c) *CRS*LGSZ* in Equation [3.5] is included to determine its stationarity before conducting OLS with robust error estimation

For the Philippines, the results of ADF root test indicates the hypothesis of non – stationary for variables *LGAP*, *LGZS*, *LOPN LCRDT,* and *LINT* are rejected after taking first difference, hence variables are I(1). Meanwhile, the hypothesis of non – stationary is rejected at level for *LCAB* and *CRS*LGSZ* or I(0). In other hand, the result of ADF root test on Indonesia reveals that the variables of *LGAP*, *LGZS, LCAB* and *CRS*LGSZ* are stationary at level or I(0). The variables of *LOPN* and *LCRDT* and *LINT* are I(1) as the hypothesis of non – stationary that is rejected at first difference. Overall, the unit root test results reveal that some variables are I(1) and I(0) for each the ASEAN – 5 countries. Therefore, non – stationary variable should be transformed into first different before they are used together with stationary variable in OLS analysis.

4.5 Economic Resilience of the ASEAN – 5 Countries

This section is devoted to the result of analysis on economic resilience measurement in order to achieve the first objective of study. This section presents the result of shock amplification and shock persistent which are estimated using OLS estimation with robust standard error.

4.4.1 Sizes of Shock Amplification and Shock Persistent

This study employs OLS analysis with robust standard error to measure the sizes of shock amplification and shock persistent for each the ASEAN – 5 countries. Table 4.4 presents the result of estimations on Equation [3.5] for each the ASEAN – 5 countries.

The size of shock amplification, γ can be calculated by plugging the coefficient of CRS_t, and the coefficient of CRS_t*$LGSZ$ into Equation [3.30]. For the size of shock persistent, it can be directly obtained from the coefficient of $LGAP_{t-1}$. Table 4.5 shows the sizes of shock amplification and shock persistent for the ASEAN – 5 countries. There are different sizes of shock amplification and shock persistent for each ASEAN – 5 countries. The ranking of shock amplification from the highest resilience to the lowest resilience are the Philippines, Singapore, Indonesia, Malaysia and Thailand.

In this respect, the overexposure to external factor through financial liberalization and international trade that the build – up vulnerability at pre – crisis was the main factor of shock amplification. For instance, Thailand is the highest shock amplification among the ASEAN – 5 countries which is related with the overexposure of capital market to external force at pre – AFC. Since the early 1990s Thailand had opened up its economy for foreign capital inflow, through financial liberalization. Due to a lacking a sufficient risk management at national level, it caused too many accumulated short – term capital inflows and increased foreign debt. As a result, short – term external debt to total external debt at pre – AFC was about 20 percent and the highest in ASEAN – 5 countries. It decreased the sovereign credit rating and investor's sentiment were adversely affected (Pangestu, 2003). This overexposure of capital market caused a sudden massive capital outflow drove out foreign capital and dramatically decreases gross domestic capital formation about 48.9 percent in 1999 which is the highest among ASEAN countries (Sangsubhan, 2008).

Table 4.4

The Results of OLS Estimation with Newey – West Standard Error for ASEAN – 5 Countries

Dependent Variables: *LGAP*

Country	Variable	Coefficient	Newey – West Standard Error	*t* – stat	*p* – value
Malaysia	C	0.634	0.117	5.419	0.000*
	$LGAP_{t-1}$	0.346	0.171	2.028	0.052**
	CRS_t	0.143	0.046	3.115	0.003*
	CRS_t*$LGSZ$	-0.421	0.130	-3.229	0.003*
	R – Squared		0.552		
	Adjusted R – Squared		0.553		
	F – statistics		8.870		
Singapore	C	0.694	0.138	5.025	0.000*
	$LGAP_{t-1}$	0.787	0.143	5.502	0.000*
	CRS_t	0.396	0.090	4.385	0.000*
	CRS_t*$LGSZ$	-0.617	0.208	-2.964	0.006*
	R – Squared		0.613		
	Adjusted R – Squared		0.597		
	F – statistics		9.265		
Thailand	C	0.484	0.104	4.662	0.000*
	$LGAP_{t-1}$	0.607	0.206	2.939	0.008*
	CRS_t	0.259	0.072	3.594	0.000*
	CRS_t*$LGSZ$	-0.797	-0.101	9.585	0.000*
	R – Squared		0.623		
	Adjusted R – Squared		0.604		
	F – statistics		8.115		
Philippines	C	0.842	0.157	5.344	0.000*
	$\Delta LGAP_{t-1}$	0.575	0.072	7.915	0.000*
	CRS_t	0.421	0.088	4.786	0.000*
	CRS_t*$LGSZ$	-0.588	0.141	-4.148	0.000*
	R – Squared		0.525		
	Adjusted R – Squared		0.494		
	F – statistics		8.728		
Indonesia	C	4.554	0.554	2.061	0.051**
	$LGAP_{t-1}$	0.425	0.755	2.351	0.026*
	CRS_t	0.317	0.070	4.583	0.000*
	CRS_t*$LGSZ$	-0.660	0.116	-5.694	0.000*
	R – Squared		0.480		
	Adjusted R – Squared		0.427		
	F – statistics		8.627		

Note: a) * and ** indicate the rejection of the null hypothesis at 5 and 10 percent, respectively

b) $LGAP_t$ and $LGAP_{t-1}$ for the Philippines is in first difference because it is not stationary at level.

Table 4.5
Sizes of Shock Amplification and Shock Persistent in ASEAN – 5 Countries, 1981 -2014

	Economic Resilience Dimension			
Country	**Shock Amplification**	**Ranking**	**Shock Persistent**	**Ranking**
Malaysia	2.948	4	0.428	1
Singapore	1.556	2	0.787	5
Thailand	3.078	5	0.607	4
Philippines	1.398	1	0.575	3
Indonesia	2.079	3	0.425	2

In this respect, the overexposure to external factor through financial liberalization and international trade that the build – up vulnerability at pre – crisis was the main factor of shock amplification. For instance, Thailand is the highest shock amplification among the ASEAN – 5 countries which is related with the overexposure of capital market to external force at pre – AFC. Since the early 1990s Thailand had opened up its economy for foreign capital inflow, through financial liberalization. Due to a lacking a sufficient risk management at national level, it caused too many accumulated short – term capital inflows and increased foreign debt. As a result, short – term external debt to total external debt at pre – AFC was about 20 percent and the highest in ASEAN – 5 countries. It decreased the sovereign credit rating and investor's sentiment were adversely affected (Pangestu, 2003). This overexposure of capital market caused a sudden massive capital outflow drove out foreign capital and dramatically decreases gross domestic capital formation about 48.9 percent in 1999 which is the highest among ASEAN countries (Sangsubhan, 2008).

During GFC, high trade intensity at pre – crisis has determined high shock amplification to Thailand's economy. Contraction in global demand due GFC has led a huge declining in export demand, output production and capital utilization and industrial labour

employment rate. It then led to a huge declining in the country's consumption, gross fixed capital formation and export demand (Sangsubhan & Basri, 2012). Thus, the impacts received by Thailand during AFC and GFC could highly diverge the economy from output potential and contribute the highest shock amplification among the ASEAN – 5 countries.

As a comparison, Malaysia is the second highest shock amplification in the ASEAN - 5 countries. Similar to Thailand's case during AFC, the source of shock amplification in this country was due to the overexposure of banking system on volatile market for shares and property at pre – crisis. The shrinking of Malaysia's currency about 50 percent due to speculative attack on Thailand's currency has devalued stock market and property price. Thus, foreign investor lost their confidence on the financial market where it caused a massive capital outflow (Ariff & Abubakar, 1999). The contraction of private investment about 43 percent was recorded which is less than the impact received in Thailand.

Meanwhile, shock amplification during GFC in Malaysia was channelled through international trade. Malaysia is the one of the most open trade – dependent countries after Singapore in the ASEAN region. This country concentrates on export of manufactured goods such as electronic and electrical export which are highly elastic demand. Weakened external demand due to GFC have contributed a steep declining in manufacturing output as result from the contraction of export demand. The impact received from AFC and GFC to Malaysia's economy via high trade openness and market capitalization makes this country the second highest shock amplification among the ASEAN – 5 countries.

Indonesia is the third highest shock amplification among the ASEAN – 5 countries. Unlike Malaysia and Thailand, the build – up vulnerability of Indonesia at pre – crisis come from a weak macroeconomic policy management (Iriana & Sjöholm, 2002; Pangestu, 2003). Since mid -1990s, economic policy was not used in countercycle way. Indonesia actually kept a tightening monetary policy with high interest rate which attracted a massive capital inflow. Moreover, weak capacity and capability of central bank to monitor risk in financial market due to corruption and political interference has added the vulnerability of this country to shock. During AFC, these vulnerabilities has contributed most adverse effect as the massive capital inflow pulled out by foreign investor (Grenville, 2004). This country has recorded declining in gross capital formation about 23.3 percent during AFC which was less than Thailand and Malaysia.

Contrary to AFC, Indonesia was least affected to GFC due to its relatively small share of international trade in GDP than other ASEAN – 5 countries. This makes Indonesia's economy less vulnerable the declining in external demand from industrial country during GFC (Sangsubhan & Basri, 2012). The declining of export demand has offset by the strong domestic demand such as private consumption and investment which helped by expansion of domestic credit (ADO, 2009). Therefore, GDP have recorded a growth as much as 4.6 percent. It indicates Indonesia has contributed a less shock amplification to this country. Although Indonesia was highly affected by AFC but, this country was appeared to be less affected by GFC. This makes shock amplification of this country lower than Thailand and Indonesia.

Meanwhile, the size of shock amplification in Singapore is lower than Thailand, Malaysia and Indonesia. Despite its high exposure financial market to external factor and highly trade dependent economy, a strong economic fundamental kept Singapore to be resilient from AFC and GFC (Iriana & Sjöholm, 2002; Briguglio *et al*. 2009). For instance, this country recorded a surplus in current account (export more than import) during AFC which is resulted from wage and cost reduction measures to boost its competitiveness and export in services. It actually helped this country to reduce shock amplification by containing further depreciation in its currency that could harm investment level (Chia, 1998; Ngiam, 2000). Meanwhile, fiscal balance of Singapore provides the best position for this county to stabilize economy during GFC. This allows this country to inject as large size of fiscal stimulus in economy to boost private and public consumption and offset the contraction in export demand (ADB, 2009; Doraisami, 2011). This will reduce the impact of the crisis and cause a small size of shock amplification.

Lastly, the Philippines is the smallest size of shock amplification among the ASEAN – 5 countries. Compared to other countries, the financial market in the Philippines was less vulnerable to AFC. Since 1980s, this country was unable to borrow foreign fund as the reputation of this country deteriorated due to political instability. As a result, the financial market held a less foreign liability manifested by short-term external debt to total external debt, 10.9 percent at pre - AFC which the lowest among ASEAN -5 countries. Thus, AFC did not cause so much reversal foreign capital inflow and currency depreciation in the Philippines (Mijares, 1999; Noland, 2000). As a result, the impact from AFC could contributes a smaller size of shock amplification compared to other countries. Also,

during GFC, the impact of this crisis was less pronounced in the Philippines. It is because this country is less dependent on international trade with total trade to GDP is 61.4 percent and lower than other the ASEAN – 5 countries (World Economic Outlook, 2015). This factor makes this country is less affected to a declining in export demand about 7.8 percent during GFC whereas, a small economic growth has been recorded at 1.1 percent. Thus, this GFC could explain the smallest size of shock amplification in the Philippines.

For shock persistent dimension in Table 4.5, the most resilience country is Malaysia and followed by Indonesia, the Philippines, Thailand, and Singapore. In this respect, Singapore is the lowest resilient among the ASEAN – 5 countries. As a small country with limited resource, Singapore is highly depending on external factors. Thus, this country is very sensitive with the persistent of weakened global market. For instance, the continued of global political instability after GFC such as such as terrorist attack on 11th September 2001, respiratory syndrome (SARS), war in Afghanistan and Iraq have undermined the global market. These factors which in turn, slowed the momentum of economic growth at post – AFC (2001 – 2003) (ADB, 2004). Similarly, external shocks after GFC such as subdued global trade, Europe's debt crisis, the falling of commodity price, increasing financial market volatility and weakening capital flows pose the highest risk to economic growth of Singapore. This shock is not only contributing a huge declining in export demand for externally dependent sectors, but it also undermines business confidence that persistently reduces investment level and prevents aggregate output to achieve potential output (ADB, 2016).

Meanwhile, the size of shock persistent in Thailand is appeared to be the second highest. The size of shock persistent in Thailand is rather determined by internal factors that hinder the economy achieve economic stability after crisis. The combination of political unrest, prolonged drought, world oil prices shock, natural disaster during 2004 – 2006 have harmed private consumption and investment. It could delay aggregate output to achieve potential output at post – AFC (ADB, 2006). Similarly, after GFC, this country faced several episodes of political unrest and military coup, and natural disaster (ADB, 2015). These conditions are likely to collapse government function overtime and increase uncertainties in investment climate. Large investment projects can be delayed due to these uncertainties which in turn, prolonged output fluctuation in business cycle (Cerra, Panizza & Saxena, 2008; Nidhiprabha, 2010).

The size of shock persistent of the Philippines is not much different with Thailand. Shock persistent in the Philippines is explained by a lack of sustained periods of improvement in the key growth determinant such as human capital and physical capital development and financial, infrastructures and, technological factors (ADB ,2010; Budina & Tulahdar, 2010; Tolo, 2011). The inadequate of key growth caused a small incremental of growth after crisis which prolong the process of stabilizing economy to potential output.

Meanwhile, Indonesia is the second lowest ranking of shock persistent. According to Sangsubhan and Basri (2012), this country is less susceptible to the persistent of external shock because its trade openness is the lowest among the ASEAN – 5 countries. In

addition, the export structure of Indonesia concentrates on natural resource and related product which its export demand is inelastic. A shock in export demand causes declining of export price rather than export volume. Therefore, the external shock causes a short – lived the contraction of export growth since export volume does not fall too much. This contributes a small size of shock persistent. However, some internal factors could prevent this country to achieve a quick economic stability. For instance, political uncertainty condition, terrorist attack and natural disaster have hindered investment level and delayed the recovery of economy after AFC (ADB, 2001)

Lastly, Malaysia is the lowest size of shock persistent among the ASEAN – 5 countries. Although this country is highly affected to a persistent weakened external factor that prolonged export contraction, this country could achieve a quick stability due to robust in domestic demand. Unlike Thailand and Indonesia, Malaysia did not encounter with any political uncertainty and natural disaster issues after economic shock. This already increased consumer confidence on domestic market. It leads to increase private consumption which is higher than other ASEAN – 5 countries and quickly offset the declining of aggregate output after economic crisis. Also, the declining of aggregate output quickly offset by the increasing in public consumption as government mainly continually increases outlay on supplies and services and public service wages (ADB, 2012).

4.5 The Effect of Fiscal Tools on Economic Resilience

This section is dedicated to the results of the impact of fiscal tools on economic resilience in the ASEAN – 5 countries, as stated in the second objective of study. In Section 4.5.1 and Section 4.5.2, the long run relationship estimation and the short run relationship estimation are discussed, respectively. The diagnostic checking of estimation is presented in Section 4.5.3.

4.5.1 The Long Run Estimation

Based on Table 4.3, the unit root result reveals that some variables series are I(1) and I(0) for each the ASEAN – 5 countries. This result signifies that ARDL estimation can be executed in this study. Subsequently, the optimal ARDL models of automatic stabilizers and discretionary fiscal based on Equation [3.37] and Equation [3.38] can be estimated based on the selected number of lags. Table 4.6 and Table 4.7 exhibit the optimal ARDL models of automatic stabilizers and discretionary for each the ASEAN – 5 countries. From the tables, different numbers of lag length have given by AIC on the automatic stabilizers and discretionary fiscal models for each ASEAN – 5 countries.

Table 4.6

The Optimal ARDL Automatic Stabilizers Model of ASEAN – 5 Countries

Dependent Variable: Δ *LGAP*

Variable	Automatic Stabilizer Model Selection				
	Malaysia (1,1,1,0,0)	Singapore (2,2,1,1,2)	Thailand (1,2,2,0,2)	Philippines (1,2,3,0,3,)	Indonesia (1,0,0,1,0)
C	10.997*	4.467*	-0.668	7.715*	0.997
	[3.220]	[1.112]	[1.883]	[2.62]	[1.524]
$LGAP_{t-1}$	0.362*	1.104*	0.199	-0.017	0.216**
	[0.149]	[0.143]	[0.144]	[0.182]	[0.123]
$LGAP_{t-2}$	-	-1.125*	-	-	-
		[0.444]			
LGSZ	2.722*	0.172	0.375	-0.803*	-2.384*
	[1.430]	[0.494]	[0.581]	[0.179]	[1.146]
$LGSZ_{t-1}$	2.722**	0.146	0.556	-0.572*	-
	[1.430]	[0.905]	[0.614]	[1.937]	
$LGSZ_{t-2}$	-	-5.548*	-1.722*	-	-
		[2.612]	[0.621]		
LOPN	-6.238*	-1.466	4.713*	0.395*	1.692*
	[2.519]	[2.444]	[0.859]	[2.202]	[0.511]
$LOPN_{t-1}$	5.735*	-5.626*	-2.476*	-1.894	-
	[2.654]	[1.973]	[1.003]	[2.422]	
$LOPN_{t-2}$	-	-	1.551	3.894	-
			[1.004]	[2.581]	
LINT	0.558*	3.306	-0.125	-0.421	-0.499
	[0.190]	[2.390]	[0.551]	[0.433]	[0.359]
$LINT_{t-1}$	-	-2.424**	-	-	-
		[1.160]			
LCRDT	-1.708*	-4.385*	2.468*	-5.371*	3.565*
	[0.654]	[1.709]	[0.746]	[1.831]	[0.410]
$LCRDT_{t-1}$	-	1.757	-2.279	1.532	-3.009*
		[1.246]	[1.200]	[1.281]	[0.463]
$LCRDT_{t-2}$	-	3.648	1.903	3.326*	-
		[2.764]	[1.274]	[1.831]	

Note: a) Numbers in ( ) represent the number of lag included for each variables in the models

b) Numbers in [ ] are standard errors.

c) * and ** indicate rejection of the null hypothesis at 5 and 10 percent significance level

Table 4.7

The Optimal ARDL Discretionary Fiscal Model of ASEAN – 5 Countries

Dependent Variable: Δ*LGAP*

Variable	Discretionary Fiscal Model Selection				
	Malaysia (1,1,0,0,0)	Singapore (1,1,0,0,0,)	Thailand (2,2,2,1,2)	Philippines (2,2,2,2,2)	Indonesia (1,1,1,1,0)
C	2.630*	4.491*	-4.496	3.571*	-0.297
	[1.180]	[1.831]	[1.630]*	[1.320]	[1.615]
$LGAP_{t-1}$	-0.350*	0.055	0.168	-0.480	0.192
	[0.094]	[0.142]	[0.154]	[0.274]	[0.145]
$LGAP_{t-2}$	-	-	-0.263	-0.780*	-
			[0.154]	[0.241]	
$LGAP_{t-3}$	-	-	-	-	-
LCAB	-0.850*	-0.333*	-0.106	-0.382	-0.193*
	[0.132]	[0.097]	[0.064]	[0.583]	[0.061]
$LCAB_{t-1}$	0.065	-0.433*	-0.131**	-0.990*	0.419*
	[0.078]	[0.104]	[0.064]	[0.251]	[0.114]
$LCAB_{t-2}$	-	-	-0.352*	-	-
			[-0.090]		
LOPN	-0.288	2.726	3.422*	1.856	-1.737**
	[1.405]	[1.664]	[1.245]	[4.269]	[0.932]
$LOPN_{t-1}$	-	-	1.383	-0.558	2.005*
			[1.293]	[3.139]	[0.660]
$LOPN_{t-2}$	-	-	-1.609**	-	-
			[0.883]		
LINT	0.279	-1.641*	0.757	-1.346	-1.844*
	[0.317]	[0.749]	[0.594]	[1.724]	[0.626]
$LINT_{t-1}$	-	-	-0.709	2.745**	1.155**
			[0.665]	[1.369]	[0.634]
LCRDT	-1.379*	-1.630*	2.925*	2.560	0.958*
	[0.535]	[0.749]	[0.732]	[1.453]	[0.327]
$LCRDT_{t-1}$	-	-	-1.720	5.882*	-
			[1.116]	[1.630]	

Note: a) Numbers in ( ) represent the number of lag included for each variables in the models

b) Numbers in [ ] are standard errors.

c) * and ** indicate rejection of the null hypothesis at 5 and 10 percent significance level

Following the optimal lag length in Table 4.6 and Table 4.7, the long run relationship is examined by utilizing the ARDL bound test. This test is used to verify the existence of cointegration among the variables in the automatic stabilizers and discretionary models. Table 4.8 displays the result of ARDL bound test.

Table 4.8
The Result of ARDL Bound test

Country	Automatic Stabilizers				Discretionary Fiscal			
	F-statistics	Critical Value			*F*-statistics	Critical Value		
		Significant level	Lower Bound	Upper Bound		Significant level	Lower Bound	Upper Bound
Malaysia	3.914*	10%	2.2	3.09	11.861*	10%	2.2	3.09
Singapore	3.949*	5%	2.56	3.49	9.206*	5%	2.56	3.49
Thailand	4.542*	1%	2.88	3.87	8.453*	1%	2.88	3.87
Philippines	6.706*				7.814*			
Indonesia	4.494*				7.141*			

Note: * indicates rejection of the null hypothesis at 5 percent significance level

In automatic stabilizer model, the results of *F* – statistics are greater than the critical value of upper bound at five percent significance level for all the ASEAN – 5 countries. Similarly, the result also suggests that *F* – statistics of discretionary fiscal are also greater than the critical value of upper bound at five percent significance level. Therefore, the null hypothesis of no cointegration is rejected in automatic stabilizers and discretionary fiscal models which in turn, these results confirm that there are long run cointegration among variables in the models for all the ASEAN – 5 countries. The existence of the long run relationship in automatic stabilizers and discretionary fiscal for the ASEAN – 5 countries allow this study to estimate the coefficient of long run among the variables. Table 4.9 exhibits the estimation of long run coefficients for each ASEAN – 5 countries.

Table 4.9

The Result of Long – Run ARDL Estimation for ASEAN – 5 countries

Dependent Variable: *LGAP*

Country	Variable	Automatic Stabilizer		Discretionary Fiscal	
		Coefficient	*t* – statistics	Coefficient	*t* – statistics
Malaysia	*C*	7.250	4.507*	1.948	2.364*
	LGSZ	-6.800	-3.826*	-	-
	LCAB	-	-	-0.581	-4.290*
	LOPN	0.790	0.985	0.213	0.205
	LCRDT	-2.679	-2.970*	-1.021	-2.825*
	LINT	0.875	0.772	0.200	0.897
Singapore	*C*	4.127	3.809*	4.756	2.402*
	LGSZ	-0.707	-3.273*	-	-
	LCAB	-	-	-0.675	-4.828*
	LOPN	6.386	5.150*	5.887	2.350*
	LCRDT	-1.917	-2.479*	-1.726	-2.095*
	LINT	0.793	0.984	-1.738	-2.173*
Thailand	*C*	-0.835	-0.370	-4.645	-3.003*
	LGSZ	-1.804	-1.765**	-	-
	LCAB	-	-	-0.134	-2.597*
	LOPN	1.245	1.839*	1.211	3.143*
	LCRDT	0.852	2.023**	0.516	0.853
	LINT	-0.156	-0.221	1.558	0.549
Philippines	*C*	1.758	2.623*	1.350	2.822*
	LGSZ	-0.509	-2.275*	-	-
	LCAB	-	-	-0.096	0.190
	LOPN	0.671	1.845**	0.520	4.578*
	LCRDT	-2.691	-2.595*	2.138	5.561*
	LINT	-0.414	-0.946	0.646	3.390*
Indonesia	*C*	1.273	0.634	-0.368	-0.183
	LGSZ	-0.304	-1.739**	-	-
	LCAB	-	-	0.279	1.744*
	LOPN	1.160	2.570*	0.331	0.349
	LCRDT	0.708	1.897**	1.187	3.464*
	LINT	-0.637	-1.462	-0.854	-2.066**

Note: * and ** indicate rejection of the null hypothesis at 5 and 10 percent significant level

The result of automatic stabilizer model reveals that the estimated coefficient of *LGSZ* is statistically significant at five percent for Malaysia, Singapore and the Philippines and significant at 10 percent for Thailand and Indonesia. It means that one percent increases in government expenditure to GDP ratio causes the decreasing of *LGAP* in long run for

all ASEAN – 5 countries. This implies that automatic stabilizer tool is countercycle response because it decreases output gap in the business cycle, which directly dampens output fluctuation to potential output.

This countercycle of automatic stabilizer is in line with the findings of Calderón and Schmidt – Hebbel (2008), Debrun and Kapoor (2010), Bogdanov (2010) and IMF (2015) in developing countries and Fatás and Mihov (2001), Debrun et al. (2008) and, McKay and Ries (2013) in OECD countries. As suggested by these studies, automatic stabilizer or the size of government would react in timely fashion with business cycle changes. During economic recession, a country tends to increase government expenditure to GDP which reflects the increasingly of government commitments on stabilizing economy by providing programs to support spending of household and firms, including unemployment benefit, social safety net, transfers and subsidies. By means of the high government size, it smooths consumption and investment levels of households and firms which in turn, stabilizes output fluctuation during economic downturn.

The estimated coefficient of automatic stabilizer for Malaysia is -6.8 which is the largest among the ASEAN – 5 countries. The value of coefficient can be interpreted as one percent increases in *LGSZ* causes the decreasing of *LGAP* by 6.8 percent in the long run. Thus, this result points that automatic stabilizers in Malaysia is countercycle where it can dampen output fluctuation in the business cycle. This result can be related with the studies of Galí (1994) and Rodrik (1998), where the size of automatic stabilizer depends on the exposure of economy to external shock. A country that is highly vulnerable to economic

shocks would opt a larger size of government in long run to insure the economy against external shocks. Due to high economic openness in Malaysia, this country has set a large government size to stabilize economy against external shock. With a large government size, it could promote a greater stabilizing effect on output fluctuation in Malaysia than other the ASEAN – 5 countries.

Contrary to Malaysia, the countercycle response of automatic stabilizer in long – run for Singapore is quite small. Although Singapore is being exposed with increasingly external risk due to its high trade intensity on economy, this country typically does not set a large government size to stabilizer economy. This country does not always increase the government size due to its cautious behaviour in government spending to maintain the surplus in fiscal balance in long run (Abeysinghe & Jayawickrama, 2008; Park, 2010). This result consistent with the finding of IMF (2015) in developed country. This study suggests that more developed countries are more prudent in their government spending because they have a better expectation on cyclical trend. Good times render an opportunity to rebuild a space for automatic stabilizers to be utilized for the next cyclical downturn.

Meanwhile, the estimated coefficients for Thailand, Indonesia and, the Philippines indicate that automatic stabilizer tools of these countries are countercycle but they are smaller than Malaysia. These countries are appeared to have smaller economic openness compared Malaysia. It means that the degree of exposure to external shock for these countries is much lower. These countries opt a small increasing in government size relatively to Malaysia in order to guard their economy against external shock. Thus, this

could contribute the small countercycle response in automatic stabilizers for Thailand, Indonesia and, the Philippines.

In the model of discretionary fiscal, the result of ARDL shows that the estimated coefficient of *LCAB,* are negative and statistically significant at five percent significance level for Malaysia, Singapore and Thailand. Thus, discretionary fiscal can be considered as countercycle response that can reduce output fluctuation to potential output in these countries in long - run. This result seems to be consistent with the finding of Badinger (2009) and Fatás and Mihov (2012) in OECD countries. According to these studies, although discretionary fiscal is subjected to lags in decision, information and implementation, but this tool still has stabilizing effect on output fluctuations. This is because of time that involves for gathering enough information on economic shock allows government to formulate appropriate plans to stabilize output fluctuation.

On other hand, the estimated coefficient of *LCAB* statistically insignificant for the Philippines at any significance level whereas, the estimated coefficient of *LCAB* are positive and statistically significant at five percent significance level. Therefore, discretionary fiscal in Philippines is acycle and discretionary fiscal in Indonesia is procycle in long - run. This result is consistent with Eskesen (2009), Bogdanov (2010) and Debrun and Kapoor (2010) in developing countries and Eller et al. (2013) countries where discretionary fiscal tool is appeared to be acycle and procycle in OECD countries. These studies argued that the procycle response can be related with institutional factors. A country with high corruption level has tendency to make excessive discretionary

government spending during economic booming. This could limit the capacity to deliver discretionary fiscal during economic recession due to insufficient government revenue. Thus, it explains the procycle discretionary fiscal behaviour in long – run. In the ASEAN– 5 countries, the ranking of lowest corruption level to the highest can be arranged as – Singapore, Malaysia, Thailand, the Philippines and Indonesia (Transparency International, 2014). This could explain the procycle discretionary fiscal is procycle in Indonesia and acycle in the Philippines in long – run. Since Singapore is the lowest corruption level, this country tends to associate with a stronger countercycle discretionary fiscal in long run which is followed by Malaysia and Thailand.

On other hand, the result of short run ARDL estimation on automatic stabilizer and discretionary fiscal models are presented in Table 4.10 and Table 4.11, respectively. The short run ARDL for automatic stabilizers model reveals that the estimated coefficient is negative and statistically significant at five percent for all the ASEAN – 5 countries. In short – run, the impact of automatic stabilizers on output fluctuation is influenced by fiscal sustainability (Briguglio et al., 2009; Park, Hur, Jha, Park & Quising 2010). It pertains to which extend a country has additional government revenue to deliver fiscal policy in timely fashion against shock in short run. In this respect, the highest impact of automatic stabilizer on output gap in short run is Singapore. This is because the county always maintains the surplus in fiscal balance which government spending has been made less than government revenue (ADB, 2015). Thus, this favourable fiscal position helps this country to deliver a sizeable automatic stabilizer which induces a great stabilization impact on output fluctuation.

Table 4.10

The Result of Short – Run ARDL Estimation: Automatic Stabilizers Model

Dependent Variable: Δ*LGAP*

Variable	Automatic Stabilizer Model				
	Malaysia (1,1,0,0,1)	Singapore (2,2,1,1,2)	Thailand (1,2,2,0,2)	Philippines (1,1,2,0,2)	Indonesia (1,0,0,1,0)
$\Delta LGAP_{t-1}$	-	1.125*	-	-	-
		[0.201]			
$\Delta LGSZ$	-0.172*	-7.323*	-2.333*	-0.805*	-2.196*
	[0.076]	[1.504]	[0.484]	[0.136]	[0.609]
$\Delta LGSZ_{t-1}$	-	5.548	-1.691*	-	-
		[5.114]	[0.484]		
$\Delta LOPN$	6.222*	4.416*	4.725*	0.394*	1.953*
	[1.662]	[1.689]	[0.624]	[1.349]	[0.481]
$\Delta LOPN_{t-1}$	-	-	1.256*	0.366	-
			[0.649]	[1.410]	
$\Delta LINT$	-1.056	3.306*	-0.306	-0.501	-0.038
	[0.817]	[1.013]	[0.328]	[0.605]	[0.561]
$\Delta LCRDT$	-1.059	-4.385*	2.513*	1.516*	3.464*
	[0.817]	[1.428]	[0.547]	[0.686]	[0.355]
$\Delta LCRDT_{t-1}$		-3.648*	1.583*	-1.100	-
		[1.596]	[0.624]	[0.938]	
ECT	-0.243*	-0.110*	-0.056*	-0.102*	-0.194*
	[0.101]	[0.023]	[0.024]	[0.014]	[0.056]

Note: a) * and ** indicate rejection of the null hypothesis at 5 and 10 percent significant level, respectively.

b) Numbers in [ ] are standard errors.

Meanwhile, the impacts of automatic stabilizer on output gap for Thailand, the Philippines, Indonesia and Malaysia in short run are much less than Singapore. The position of fiscal policy for these countries is typically in deficit position since AFC (ADB, 2015). Thus, it renders a limited a government's ability in delivering automatic stabilizer in timely fashion. Among the ASEAN – 5 countries, Malaysia is typically associated with the largest and persistent fiscal deficit which hinder this country to deliver automatic stabilizer in timely fashion. This could explain the weakest countercycle of automatic stabilizer on output fluctuation in short run.

The coefficients of *ECT* for all the ASEAN – 5 countries are found to be negative and significant at five percent level of significance. These results can be interpreted as disequilibrium in *LGAP* is offset by the short run adjustment for each year by 24.3 percent, 11.0 percent, 5.6 percent, 10.2 percent and 19.4 percent in Malaysia, Singapore, Thailand, the Philippines and Indonesia, respectively.

From discretionary fiscal perspective in short run, the result in Table 4.15 reveals that the estimated variables *LCAB* are negative and statistically significant at five percent level of significance for Malaysia, Singapore, Indonesia and the Philippines. This result indicates that discretionary fiscal is countercycle for a Malaysia, Singapore, Indonesia and the Philippines. Meanwhile, the estimated variables of *LCAB* for Thailand negative and significance at five percent whereas, the estimated variables $LCAB_{t-1}$ become positive and significant at five percent for Thailand. Malaysia is appeared to be the highest countercycle response in short run which followed by Singapore and Indonesia. The Philippines and Thailand has the weakest countercycle of discretionary fiscal among the ASEAN – 5 countries.

This cyclicality response of fiscal discretionary in short run can be related with institutional factors. As argued by Tornell and Lane (1999), Andersen and Hobøll (2010), Doraisami (2011), Sangsubhan and Wangcharoenrung (2011) and Pererea and Lee (2013), a country with high corruption level and low transparency causes a great error on decision making and misallocates of discretionary fiscal in short run. It prevents the optimal impact of fiscal discretionary in stabilizing economy. In this regard, high

corruption level and low transparency level in Indonesia, Thailand and the Philippines reflect the institutional quality in these countries are weak (World Economic Forum, 2017). Thereby, the countercycle of fiscal discretionary could be weak in this country in short run. For Malaysia and Singapore, corruption levels is relatively lower than other country which reflects a strong institutional factor. The misallocation of discretionary fiscal in short run is likely to be occurred hence, it promotes a great stabilization of fiscal discretionary in short run.

Table 4.11
The Result of Short – Run ARDL Estimation: Discretionary Fiscal Model
Dependent Variable: Δ*LGAP*

Variable	Discretionary Fiscal Model				
	Malaysia (1,1,0,0,0)	Singapore (1,1,0,0,0)	Thailand (2,2,2,1,2)	Philippines (2,2,2,2,2)	Indonesia (1,1,1,1,0)
$\Delta LGAP_{t-1}$	-	-	0.136**	1.754*	-
			[0.075]	[0.237]	
$\Delta LCAB$	-0.864*	-0.311*	-0.106*	-0.082*	-0.203*
	[0.097]	[0.071]	[0.040]	[0.031]	[0.047]
$\Delta LCAB_{t-1}$	-	-	0.278*	1.856	-
			[0.051]	[1.230]	
$\Delta LOPN$	7.077*	2.346*	3.422*	1.856	1.704*
	[1.146]	[0.956]	[0.668]	[1.230]	[0.571]
$\Delta LOPN_{t-1}$	-	-	1.609*	1.253	-
			[0.459]	[1.095]	
$\Delta LINT$	0.521	-0.963*	-1.460*	-0.438*	-1.851*
	[0.844]	[0.993]	[0.343]	[0.775]	[0.440]
$\Delta LINT_{t-1}$	-	-	-	-0.406*	-
				[0.779]	
$\Delta LCRDT$	-1.569*	-3.094*	2.922*	2.560*	0.735
	[0.648]	[1.461]	[0.486]	[0.750]	[0.461]
$\Delta LCRDT_{t-1}$	-	-	1.704*	1.586**	-
			[0.563]	[0.742]	
ECT	-0.190*	-0.129*	-0.167**	-0.064*	-0.176*
	[0.012]	[0.024]	[0.076]	[0.029]	[0.029]

Note: a) * and ** indicate rejection of the null hypothesis at 5 and 10 percent significant level, respectively.
b) Numbers in [ ] are standard errors.

In the short run ARDL estimation of discretionary fiscal model, the coefficient of *ECT* is found negative and significant at five percent level for Malaysia, Singapore, the Philippines and Indonesia whereas the coefficient of ECT is negative and significant at 10 percent for Thailand. These results indicate that the disequilibrium of *LGAP* is gradually adjusted toward to equilibrium by 19 percent, 12.9 percent, 16.7 percent, 6.4 percent and 17.6 percent for each year in Malaysia, Singapore, Thailand, the Philippines and Indonesia, respectively.

Subsequently, these ARDL estimations are followed by diagnostic checking test in order to ensure the ARDL models serial correlation problems. The results of Breusch – Godfrey Serial Correlation LM tests for automatic stabilizers and discretionary fiscal model is presented in Table 4.12

Table 4.12
The Result of Breusch – Godfrey Serial Correlation LM tests

Country	Automatic Stabilizers		Discretionary Fiscal	
	F - statistics	Probability	*F* - statistics	Probability
Malaysia	1.242	0.312	1.424	0.265
Singapore	0.005	0.941	0.470	0.630
Thailand	0.298	0.746	2.923	0.118
Philippines	0.219	0.805	2.576	0.159
Indonesia	2.189	0.138	1.699	0.212

From the Table 4.12, the probability of *F* – statistics in automatic stabilizers ARDL models are greater than any significance level for all the ASEAN – 5 countries. Therefore, the null hypothesis of no serial correlation in the models is failed to be rejected. These results can be deduced that serial correlation is absent in automatic stabilizers ARDL models. Similarly, there is no serial correlation problem in discretionary fiscal ARDL

models. This is corresponding with the probability of F – statistics greater than significance levels where the null hypothesis of no serial correlation is not rejected.

In term of the stability of the model, CUSUMSQ test is executed on automatic stabilizers and discretionary fiscal models. Figure 4.1 and Figure 4.2 demonstrate the result of CUSUMSQ test on the both models for each the ASEAN – 5 countries. In automatic stabilizers ARDL model, the trends of recursive residuals series are within the critical bound at five percent significance level. Therefore, the automatic stabilizers models are stable overtime for all the ASEAN – 5 countries. Also, CUSUMSQ test exhibits discretionary fiscal ARDL models for the ASEAN – 5 countries are stable overtime as the series of recursive residual is between the critical bound.

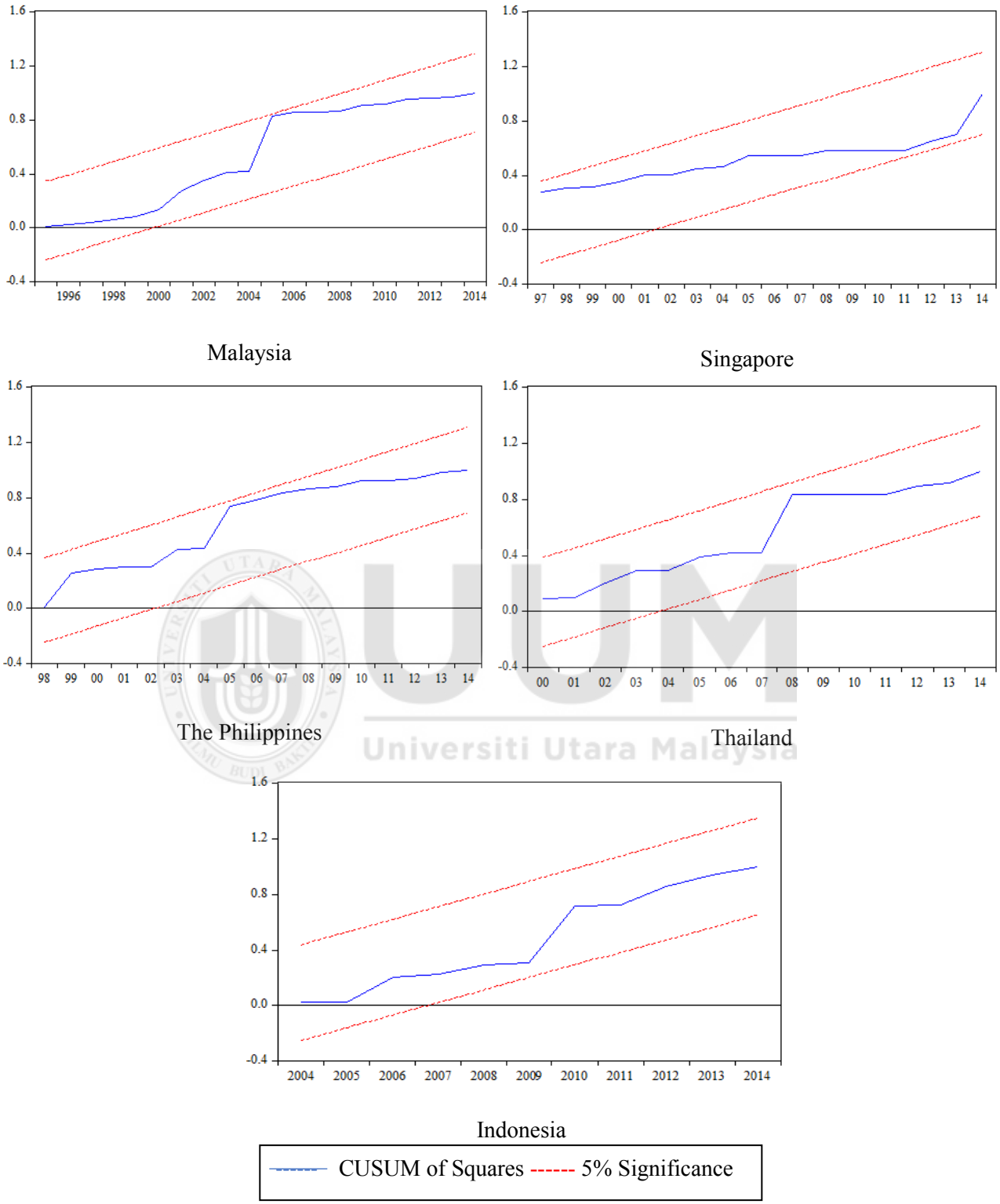

Figure 4.1
The Result of CUSUMSQ Stability on Automatic Stabilizers ARDL Models

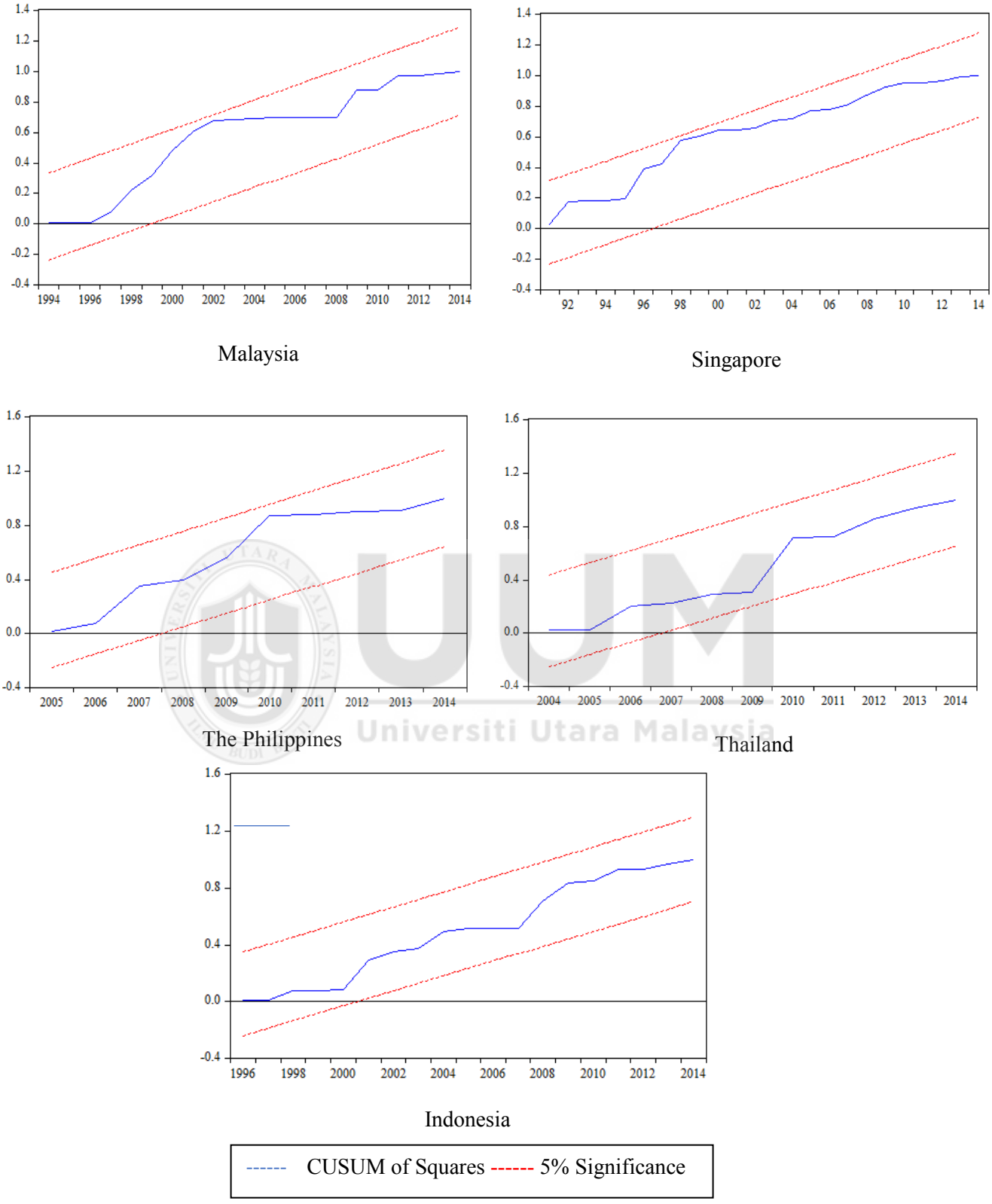

Figure 4.2
The Result of CUSUMSQ Stability on Discretionary Fiscal ARDL Model

4.6 The Effectiveness of Fiscal Policy on Economic Resilience

This section is devoted to discuss the effectiveness of fiscal policy on economic resilience as outlined in the third objective of study. To deduce the effectiveness of fiscal policy on economic resilience, this study obtains the coefficient ϕ_2 and π_2 by estimating the Equation [3.47] – Equation [3.50] for each the ASEAN – 5 countries. The coefficients thereby, are compared with the estimated coefficient α_2 and θ_2 in Equation [3.35] and Equation [3.36]. The estimated coefficient α_2 and θ_2 actually capture the countercycle of automatic stabilizer for 1981 – 2014 period.

4.6.1 Asian Financial Crisis

In ARDL estimation procedure, the optimal conditional error - correction model of automatic stabilizer and discretionary fiscal tools are selected based on the number of lag length suggested by AIC. The optimal model for automatic stabilizers in Equation [3.39] and discretionary fiscal Equation [3.40] are presented in Table 4.13 and Table 4.14, respectively. Based on Table 4.13 and Table 4.14, different the number of lags has been selected on automatic stabilizers model and discretionary fiscal model for each country.

Table 4.13

ARDL Conditional Error - Correction Automatic Stabilizers Model of ASEAN – 5 Countries: The Case of AFC

Dependent Variable: Δ*LGAP*

Variable	Automatic Stabilizer Model				
	Malaysia (1,0,1,1,0)	Singapore (1,1,1,1,1)	Thailand (1,1,1,1,0)	Philippines (1,1,0,0.1)	Indonesia (1,0,0,1,0)
C	6.088*	22.916*	2.076*	6.273*	4.472*
	[2.249]	[8.142]	[0.340]	[2.114]	[2.090]
$LGAP_{t-1}$	-0.773*	-1.065*	-2.904*	-1.342*	-0.632*
	[0.141]	[0.271]	[0.269]	[0.133]	[0.214]
LGSZ	-7.738	-	-	-	-
	[1.388]				
$LGSZ_{t-1}$	-	-5.063*	-5.459*	-3.040**	-2.823**
		[1.616]	[0.802]	[1.550]	[1.502]
LOPN	-	-	-	-3.926*	3.406*
				[1.548]	[0.670]
$LOPN_{t-1}$	1.197**	6.124*	2.334*	-	-
	[0.615]	[2.453]	[0.785]		
LINT	-	-	-	-0.455	-
				[0.279]	
$LINT_{t-1}$	1.233*	0.621	-3.650*	-	-3.197*
	[0.397]	[1.239]	[0.683]		[1.134]
LCRDT	-1.246**	-	1.327*	-	-
	[0.698]		[0.381]		
$LCRDT_{t-1}$	-	-7.597*	-	-3.203*	1.596*
		[3.605]		[0.776]	[0.672]
Δ*LGSZ*	-	0.006	-0.038	-7.238*	-0.188
		[0.413]	[1.050]	[1.635]	[1.311]
Δ*LOPN*	5.520*	-0.621	4.777*	-	-
	[1.834]	[2.560]	[1.449]		
Δ*LINT*	-0.832	2.571**	-2.338*	-	-1.821**
	[0.920]	[1.413]	[0.634]		[0.922]
Δ*LCRDT*		-4.535*	-	1.998*	0.228
		[2.125]		[0.950]	[0.755]
AFC	-0.614*	0.146	0.155	0.609**	0.316**
	[0.156]	[0.166]	[0.162]	[0.211]	[0.180]
$AFC * \Delta LGSZ_{t-1}$	-11.506*	2.828	-1.547	2.177*	4.329*
	[4.073]	[3.964]	[1.863]	[4.595]	[0.879]

Note: a) * and ** indicate rejection of the null hypothesis at 5 and 10 percent significant level, respectively.

b) Numbers in [ ] are standard errors.

Table 4.14

ARDL Conditional Error - Correction Discretionary Fiscal Model of ASEAN – 5 Countries: The Case of AFC

Dependent Variable: Δ*LGAP*

Variable	Discretionary Fiscal Model				
	Malaysia (1,0,0,1,1)	Singapore (1,1,0,0,1)	Thailand (1,1,0,1,1)	Philippines (1,1,0,0,1)	Indonesia (1,1,0,1,1)
C	2.171*	3.284	5.248*	-0.265	0.772
	[0.486]	[4.268]	[1.250]	[1.353]	[1.826]
$LGAP_{t-1}$	-1.209*	-1.209*	-1.084*	-1.147*	-0.758*
	[0.150]	[0.185]	[0.135]	[0.137]	[0.219]
LCAB	-0.269	-	-	-	-
	[0.184]				
$LCAB_{t-1}$	-	-0.816*	-0.392**	0.813*	0.379*
		[0.176]	[0.211]	[0.354]	[0.147]
LOPN	-3.907*	1.208	3.201*	1.356*	-0.582
	[1.583]	[1.524]	[0.643]	[0.672]	[0.873]
LINT	-	-	-	-0.537	-
				[0.386]	
$LINT_{t-1}$	6.244*	-1.902*	1.720*	-	-0.827**
	[1.652]	[0.978]	[0.426]		[0.423]
$LCRDT_{t-1}$	8.515*	-2.487*	-0.378	-2.334*	1.023*
	[1.908]	[1.123]	[0.427]	[0.660]	[0.369]
Δ*LCAB*	-	-0.322*	-0.230*	0.279	-0.037
		[0.102]	[0.097]	[0.235]	[0.122]
Δ*LINT*	-1.053	-	-1.273*	-	-1.823*
	[0.632]		[0.414]		[0.688]
Δ*LCRDT*	-6.284*	-3.335**	3.463*	2.435*	-0.280
	[1.425]	[1.659]	[0.564]	[0.929]	[0.851]
AFC	-0.716*	0.136	0.157	0.518*	0.004
	[0.114]	[0.153]	[0.244]	[0.212]	[0.146]
$AFC * \Delta LCAB_{t-1}$	-0.455 [0.150]*	0.298 [0.241]	-1.571* [0.596]	0.145 [0.421]	-0.368 [0.221]

Note: a) * and ** indicate rejection of the null hypothesis at 5 and 10 percent significant level, respectively.

b) Numbers in [ ] are standard errors.

Subsequently, bound test is executed on these models to determine the existence of cointegration among the variables. The results of ARDL bound test are exhibited in Table 4.15

Table 4.15
The Result of ARDL Bound test

Country	Automatic Stabilizers				Discretionary Fiscal			
	F-statistics	Critical Value			*F*-statistics	Critical Value		
		Significant level	Lower Bound	Upper Bound		Significant level	Lower Bound	Upper Bound
Malaysia	9.187*	10%	2.2	3.09	13.836*	10%	2.2	3.09
Singapore	3.526*	5%	2.56	3.49	10.578*	5%	2.56	3.49
Thailand	20.239*	1%	2.88	3.87	6.809*	1%	2.88	3.87
Philippines	9.228*				7.301*			
Indonesia	3.511*				11.038*			

Note: * indicates rejection of the null hypothesis at 5 percent significance level

The result of ARDL bound test signifies that *F* – statistics for each country in automatic stabilizers model and discretionary fiscal model are greater that critical value at five percent significant level. These results signify that there are cointegration between variables in automatic stabilizers and discretionary fiscal models. These results permit the estimation of long run relationship for automatic stabilizers and discretionary fiscal models during AFC which are shown in Table 4.16. From the table, the estimated coefficient ϕ_2 and π_2 are represented by the coefficient of *LGSZ* and *LCAB,* respectively. To determine the effectiveness of fiscal tools, the estimated ϕ_2 is compared with estimated coefficient α_2 whereas, π_2 is compared with θ_2 as stated in Table 4.17.

Table 4.16

The Result of Long – Run ARDL Estimation for ASEAN – 5 countries: The Case of AFC

Dependent Variable: *LGAP*

Country	Variable	Automatic Stabilizer		Discretionary Fiscal	
		Coefficient	*t* – statistics	Coefficient	*t* – statistics
Malaysia	*C*	2.783	4.074*	1.796	5.169*
	LGSZ	-10.064	2.242*	-	-
	LCAB	-	-	-0.223	-2.478*
	LOPN	1.547	2.032*	1.231	2.783*
	LCRDT	1.594	2.766*	1.043	5.769*
	LINT	-1.610	1.027	1.165	3.887*
Singapore	*C*	1.507	3.689*	2.715	0.755
	LGSZ	-4.752	-6.289*	-	-
	LCAB	-	-	-0.813	-3.973*
	LOPN	5.747	3.043*	3.998	1.929**
	LCRDT	-2.130	-2.060*	-2.056	-2.353*
	LINT	0.583	1.056	-1.573	-0.829
Thailand	*C*	5.764	4.601*	4.839	4.037*
	LGSZ	-2.605	-7.260*	-	-
	LCAB	-	-	-0.362	-2.063*
	LOPN	1.114	2.496*	2.951	4.433*
	LCRDT	0.633	3.169*	0.348	2.839*
	LINT	-1.742	-4.028	1.586	4.231*
Philippines	*C*	4.672*	2.947*	-0.231	1.182
	LGSZ	-0.338	-1.598	-	-
	LCAB	-	-	0.708	2.148*
	LOPN	1.078	2.109*	1.182	1.938*
	LCRDT	-2.264	-1.972**	-2.035	-3.175*
	LINT	-2.406	-4.058*	-0.468	-1.366
Indonesia	*C*	6.141	2.080**	1.018	0.425
	LGSZ	-1.487	-0.709	-	-
	LCAB	-	-	0.500	1.785**
	LOPN	2.302	1.824*	2.688	2.577*
	LCRDT	0.828	2.001**	1.091	3.163*
	LINT	-3.080	-1.969**	-1.018	-2.282*

Note: * and ** indicate rejection of the null hypothesis at 5 and 10 percent significant level

Table 4.17

The effectiveness of Automatic Stabilizers and Discretionary Fiscal: The Case of AFC

Model	Country	Coefficient		Result	Effectiveness
		ϕ_2	α_2		
Automatic Stabilizers	Malaysia	-10.064*	-6.800*	$\phi_2 < \alpha_2$	effective
	Singapore	-4.752*	-0.707*	$\phi_2 < \alpha_2$	effective
	Thailand	-2.605*	-1.804*	$\phi_2 < \alpha_2$	effective
	Philippines	-0.338	-0.509*	$\phi_2 > \alpha_2$	ineffective
	Indonesia	-1.487	-0.304**	$\phi_2 < \alpha_2$	effective
	Country	Coefficient		Result	Effectiveness
		π_2	θ_2		
Discretionary Fiscal	Malaysia	-0.223*	-0.581*	$\pi_2 > \theta_2$	ineffective
	Singapore	-0.813*	-0.675*	$\pi_2 < \theta_2$	effective
	Thailand	-0.362*	-0.134*	$\pi_2 < \theta_2$	effective
	Philippines	0.708*	-0.096	$\pi_2 > \theta_2$	ineffective
	Indonesia	0.500*	0.279*	$\pi_2 > \theta_2$	ineffective

Note: a) * and ** indicate rejection of the null hypothesis at 5 and 10 percent significant level

b) the estimated coefficient α_2 and θ_2 are obtained from Table 4.9

The estimated coefficient ϕ_2 in automatic stabilizers model is found to be less than α_2 for all the ASEAN – 5 countries except, the Philippines. The result signifies that the countercycle of automatic stabilizer was greater during AFC than the impact of automatic stabilizer for 1981 – 2014 period. Thus, automatic stabilizer is considered as effective in these countries. The surplus position of fiscal balance at pre – AFC renders a favourable condition for these countries to increase government size in a timely manner which in turn, quickly offset the adverse effect from the crisis. However, automatic stabilizers for the Philippines seem to be ineffective as ϕ_2 greater than α_2. Due to the weakness of tax collection, fiscal balance has been deficit position at pre – AFC (ADB, 1997). Thus, it constrained automatic stabilizers to be delivered quickly during the crisis.

Table 4.17 shows that fiscal discretionary is effective for Singapore and Thailand where π_2 is lesser than θ_2. The impact of fiscal discretionary could contribute a larger impact in stabilizing output fluctuation during AFC. This country has entered the crisis with a substantial surplus in fiscal balance which assists this country to deliver several fiscal discretionary, in form of stimulus packages during the crisis. These stimulus packages help to improve its competitiveness, boost export demand and achieve a quick economic stability (Ngiam, 2000). Moreover, the low corruption level in this country could contribute a greater impact of fiscal discretionary on economy (Transparency International, 2018). Discretionary spending is less likely to be misused for political motive that that cause a non – optimal impact on stabilizing economy. Meanwhile, the effectiveness of fiscal stimulus in Thailand is contributed by large fiscal balance at pre – crisis. It allows the country to deliver a large fiscal stimulus program which is largely driven by the need to finance the scarcity of investment and domestic credit for private sectors (Berg, 1999). Thus, the impact of fiscal discretionary for Thailand would be higher during AFC.

On other hand, the estimated coefficient π_2 are higher than estimated coefficient θ_2 for Malaysia, the Philippines and Indonesia. Thereby, discretionary fiscal is considered as ineffective for these countries where the countercycle of discretionary fiscal decreased during AFC. In Malaysia, the small countercycle of fiscal discretionary during AFC is explained by the late introduction of fiscal expansionary to boost AD during the crisis. This is because Malaysia has adopted fiscal contraction approach at the early stage of crisis to prevent further depreciation in domestic currency and capital reversal inflow

(Ariff, 1999). It reduced the countercycle impact of fiscal discretionary on economy. Meanwhile, the result shows that discretionary fiscal became procycle for the Philippines whereas discretionary fiscal remained procycle for Indonesia during AFC. Such chronic corruption problems and political instability in these countries during AFC period has hinder the positive effect fiscal discretionary on economy in the long – run (Akitoby, Clements, Gupta & Inhauste, 2006; Kuncoro, 2014). Thus, discretionary fiscal is appeared to be ineffective in these countries.

4.6.2 Global Financial Crisis

The optimal conditional error – correction ARDL automatic stabilizers and discretionary fiscal models for the case GFC are presented in Table 4.18 and Table 4.19, respectively. There are different number of lags has been selected in automatic stabilizer model and discretionary fiscal for each the ASEAN – 5 countries based on AIC leg length selection criteria. Subsequently, the ARDL bound test is executed in order to determine the existence of cointegration between the variable in the both models. The result of ARDL bound test is exhibit in Table 4.24. The ARDL bound test reveals that F – statistics in automatic stabilizer model for each country are greater than critical value at five percent significance level. Similarly, F – statistics in discretionary fiscal model are found to be greater than critical value at five percent significant level. These results indicate that cointegration relationship does exists in the both models.

Table 4.18

ARDL Conditional Error Correction Automatic Stabilizers Model of ASEAN – 5 Countries: The case of GFC

Dependent Variable: Δ*LGAP*

Variable	Automatic Stabilizer Model				
	Malaysia (1,1,1,0,1)	Singapore (1,1,1,1,0)	Thailand (1,1,1,0,1)	Philippines (1,0,0,0,1)	Indonesia (1,1,0,1,1)
C	1.530	1.951*	-2.221	2.018*	2.372*
	[1.624]	[0.708]	[1.465]	[0.855]	[1.042]
$LGAP_{t-1}$	-0.957*	-0.983*	-0.985*	-1.298*	-0.834*
	[0.143]	[0.215]	[0.118]	[0.161]	[0.283]
LGSZ	-4.086*	-	-	-3.926*	-
	[1.975]			[1.548]	
$LGSZ_{t-1}$	-	-4.676*	-1.115**	-	-4.139*
		[1.185]	[0.544]		[1.834]
LOPN	-	-	-	0.762	5.221*
				[2.293]	[1.003]
$LOPN_{t-1}$	1.147	4.536*	1.172*	-	-
	[0.854]	[2.129]	[0.472]		
LINT		-7.244*	0.240	-0.392	-
		[3.919]	[0.422]	[0.333]	
$LINT_{t-1}$	0.419		-	-	-4.929*
	[0.519]				[1.718]
$LCRDT_{t-1}$	-2.181*	-7.244**	0.996*	-1.093*	2.934**
	[0.718]	[3.919]	[0.260]	[0.430]	[1.089]
Δ*LGSZ*	-	6.248*	1.581*	-	-0.097
		[1.232]	[0.464]		[1.561]
Δ*LOPN*	-4.781*	4.136	2.706*	-	-
	[2.714]	[3.072]	[0.852]		
Δ*LINT*	-3.936*	-	-	-	-2.213*
	[1.298]				[1.223]
Δ*LCRDT*	-0.720	-1.985	-2.163*	1.782	-2.109*
	[1.112]	[1.899]	[0.822]	[1.091]	[0.806]
GFC	-0.454*	-0.628*	0.289*	-0.082	0.238
	[0.201]	[0.231]	[0.720]	[0.253]	[0.242]
$GFC * \Delta LGSZ_{t-1}$	-8.445*	3.816*	-7.915*	-6.599	-3.821
	[4.174]	[0.675]	[2.841]	[7.888]	[2.557]

Note: a) * and ** indicate rejection of the null hypothesis at 5 and 10 percent significant level, respectively.

b) Numbers in [ ] are standard errors.

Table 4.19

ARDL Conditional Error Correction Discretionary Fiscal Model of ASEAN – 5 Countries during GFC

Dependent Variable: Δ*LGAP*

Variable	Discretionary Fiscal Model				
	Malaysia (1,1,0,1,1)	Singapore (1,1,0,1,1)	Thailand (1,1,1,1,1)	Philippines (1,1,1,1,1)	Indonesia (1,1,0,1,1)
C	8.540*	7.626*	5.420	0.528	5.549*
	[2.246]	[2.434]	[3.524]	[1.742]	[0.400]
$LGAP_{t-1}$	-0.560*	-1.327*	-2.539*	-1.335*	-1.293*
	[0.139]	[0.207]	[0.464]	[0.326]	[0.067]
$LCAB_{t-1}$	-1.179*	-0.645*	-1.107*	-0.887	-0.396*
	[0.320]	[0.164]	[0.304]	[0.537]	[0.047]
LOPN	1.138*	2.531	-	-	-
	[0.452]	[2.232]			
$LOPN_{t-1}$	-	-	6.444*	-1.697*	-2.356*
			[2.207]	[0.841]	[0.211]
$LINT_{t-1}$	-0.859*	-2.473*	-3.818*	2.139*	0.165
	[0.246]	[0.825]	[1.237]	[0.830]	[0.117]
$LCRDT_{t-1}$	-3.426*	-2.880*	2.493	3.070*	0.702*
	[0.753]	[1.007]	[1.419]	[1.193]	[0.118]
Δ*LCAB*	-0.920*	-0.253*	-0.367*	-0.718*	-0.273*
	[0.093]	[0.101]	[0.129]	[0.305]	[0.013]
Δ*LOPN*	-	-	7.882*	-4.031	0.515**
			[2.648]	[2.730]	[0.229]
Δ*LINT*	-4.035*	-2.312*	-3.195*	-3.986*	-2.202*
	[1.072]	[1.088]	[1.295]	[1.315]	[0.293]
Δ*LCRDT*	0.044	-3.180**	3.432*	2.482	-1.153*
	[0.439]	[1.564]	[1.300]	[1.390]	[0.201]
GFC	-0.372*	-0.184	-0.370**	-0.209	0.022
	[0.111]	[0.181]	[0.192]	[0.246]	[0.023]
$GFC * \Delta LCAB_{t-1}$	-1.562*	0.106	3.481**	-1.603*	-2.467*
	[0.288]	[1.156]	[1.760]	[0.793]	[0.093]

Note: a) * and ** indicate rejection of the null hypothesis at 5 and 10 percent significant level, respectively.

b) Numbers in [ ] are standard errors.

Table 4.20
The Result of ARDL Bound test

Country	Automatic Stabilizers				Discretionary Fiscal			
	F-statistics	Critical Value			*F*-statistics	Critical Value		
		Significant level	Lower Bound	Upper Bound		Significant level	Lower Bound	Upper Bound
Malaysia	10.948*	10%	2.2	3.09	6.654*	10%	2.2	3.09
Singapore	7.052*	5%	2.56	3.49	7.981*	5%	2.56	3.49
Thailand	9.496*	1%	2.88	3.87	7.453*	1%	2.88	3.87
Philippines	9.577*				5.288			
Indonesia	9.665*				4.474*			

Note: * indicates rejection of the null hypothesis at 5 percent significance level

Based on the result of ARDL bound test, the estimation of long run cointegration for automatic stabilizer and discretionary fiscal model in Table 4.21. From this table, the estimated coefficient of ϕ_2 is compared with the coefficient α_2 in order to deduce the effectiveness of automatic stabilizers during GFC. Meanwhile, the effectiveness of discretionary fiscal will be determined for each the ASEAN -5 countries by comparing estimated coefficient of π_2 with θ_2. This comparison is shown in Table 4.22.

In automatic stabilizer model, the result reveals that the estimated coefficient ϕ_2 is less than α_2 for all the ASEAN – 5 countries except, Thailand. This result indicates the countercycle of automatic stabilizer seem to be stronger during GFC than the countercycle of automatic stabilizer for during period 1981 -2014. This result shows that automatic stabilizer is effective for these countries. The strong impact automatic stabilizers for Malaysia, Indonesia and the Philippines are contributed by the increasing of government size in timely fashion during GFC. The increasing of government size has caused public debt to be slightly increased during the crisis (Doraisami, 2011).

Meanwhile, Singapore was not having problem to increase its government size in timely fashion as this country registered a substantial fiscal surplus over years.

Table 4.21
The Result of Long – Run ARDL Estimation for ASEAN – 5 countries during GFC
Dependent Variable: *LGAP*

Country	Variable	Automatic Stabilizer		Discretionary Fiscal	
		Coefficient	*t* – statistics	Coefficient	*t* – statistics
Malaysia	*C*	1.598	1.611	1.522	3.631*
	LGSZ	-4.265	-1.901*	-	-
	LCAB	-	-	-2.103	-4.383*
	LOPN	1.198	-1.944**	2.030	1.995*
	LCRDT	-2.276	-2.951*	-6.109	-3.486*
	LINT	0.438	0.426	-1.532	-3.698*
Singapore	*C*	1.261	2.356*	1.746	3.326*
	LGSZ	-4.845	-6.237*	-	-
	LCAB	-	-	-0.486	-3.418*
	LOPN	4.611	1.836*	4.097	-3.014*
	LCRDT	-7.362	-1.699	-2.170	1.035
	LINT	3.271	2.365*	1.863	3.126*
Thailand	*C*	2.253	1.316	2.320	1.449
	LGSZ	-1.132	-1.873**	-	-
	LCAB	-	-	-0.178	-1.241
	LOPN	1.189	2.892*	2.676	2.082*
	LCRDT	1.115	3.875*	2.385	2.480*
	LINT	0.244	0.595	0.412	1.798**
Philippines	*C*	1.555	2.282*	0.396	2.837*
	LGSZ	-3.024	-2.574*	-	-
	LCAB	-	-	-0.164	-1.215
	LOPN	0.587	0.333	1.271	0.298
	LCRDT	-0.842	-2.478*	-0.602	2.703*
	LINT	-0.302	-1.154	-0.299	4.512*
Indonesia	*C*	2.637	3.393*	4.290	11.044*
	LGSZ	-4.960	-2.761*	-	-
	LCAB	-	-	-0.060	-1.401
	LOPN	0.858	2.518*	0.821	8.646*
	LCRDT	-3.517	-2.753*	-0.543	-7.470*
	LINT	-5.908	-1.906**	0.127	1.345

Note: * and ** indicate rejection of the null hypothesis at 5 and 10 percent significant level

Table 4.22

The effectiveness of Automatic Stabilizers and Discretionary Fiscal: The Case of GFC

Model	Country	Coefficient		Result	Effectiveness
		ϕ_2	α_2		
Automatic Stabilizers	Malaysia	-4.265*	-6.800*	$\phi_2 < \alpha_2$	effective
	Singapore	-4.845*	-0.707*	$\phi_2 < \alpha_2$	effective
	Thailand	-1.132*	-1.804*	$\phi_2 > \alpha_2$	ineffective
	Philippines	-3.024*	-0.509*	$\phi_2 < \alpha_2$	effective
	Indonesia	-4.960*	-0.304**	$\phi_2 < \alpha_2$	effective
	Country	Coefficient		Result	Effectiveness
		π_2	θ_2		
Discretionary Fiscal	Malaysia	-2.103*	-0.581*	$\pi_2 < \theta_2$	ineffective
	Singapore	-0.486*	-0.675*	$\pi_2 < \theta_2$	ineffective
	Thailand	-0.178	-0.134	$\pi_2 < \theta_2$	ineffective
	Philippines	-0.164	-0.096	$\pi_2 < \theta_2$	ineffective
	Indonesia	-0.060	0.279*	$\pi_2 < \theta_2$	ineffective

Note: a) * indicates the rejection of the null hypothesis at five percent significant level

b) the estimated coefficient α_2 and θ_2 are obtained from Table 4.9

Meanwhile, automatic stabilizer seems to be ineffective for Thailand as ϕ_2 is greater than α_2. The result implies that the countercycle response of automatic stabilizers is decreasing during GFC. The political turmoil 2008 – 2009 during GFC seem to limit the government size. Thus, this factor could deteriorate the effectiveness of automatic stabilizers during GFC.

Based on the result in Table 4.22, discretionary fiscal tool is found to be ineffective for Malaysia and Singapore as the estimated coefficient π_2 less than θ_2. This result signifies that the countercycle of fiscal discretionary tools was decreasing during GFC. Due to high trade intensity that have been increasing over years, the positive impact of discretionary government spending in Malaysia and Singapore during GFC seems to be leaked through import demand in long - run (Rafiq, 2013; Tang, Liu & Cheung, 2013; Kawai & Zhai,

2010). As a result, discretionary fiscal has less impact to stabilize economy. Furthermore, in Singapore, the pessimism of behaviour during GFC has caused household to make more saving for precautionary purpose rather than consuming. Thus, a discretionary fiscal only creates a small increasing in household consumption and aggregate output, which contribute a decreased countercycle (Eskesen, 2009).

For Thailand, although the estimated coefficient π_2 is found to be insignificant despite it is less than estimated coefficient θ_2. This result reveals that discretionary fiscal does not have impact on the economy hence, discretionary fiscal is considered as ineffective. In this respect, such political turmoil that took place in 2008 – 2009 are likely to collapse government function to enforce discretionary spending (Alesina, Alberto, Ozler, Roubini & Swagel, 1996).

Meanwhile, the estimated coefficient π_2 for Indonesia and the Philippines is greater than θ_2 but insignificant at any significance level. This result indicates that discretionary does not has contribute a significant effect in stabilizing economy during GFC. Corruption level is remained at high level for this country and there is not much improvement to reduce corruption level (Transparency International, 2008). Thereby, discretionary fiscal is less likely to bring any positive effect as government spending is being misused for political purpose rather than stabilizing the economy.

4.7 Conclusion

In the first objective of study, the OLS robust standard error has been used to measure the size of shock amplification and shock persistent. This analysis reveals that each ASEAN – 5 countries has different the size of shock amplification and the size of persistent. For the second objective, long – run ARDL estimation is used to determine the impact of fiscal tools output fluctuation. The long – run ARDL estimation indicates that automatic stabilizers and fiscal discretionary fiscal tools play important role to dampen output fluctuation which promote economic resilience. Finally, ARDL conditional error correction is utilized to investigate the effectiveness of fiscal tool during AFC and GFC as outlined in third objective. The result reveals that fiscal tools in each ASEAN – 5 countries has different effectiveness in dealing with AFC and GFC.

CHAPTER FIVE

CONCLUSION AND POLICY IMPLICATION

5.1 Introduction

This chapter is devoted to summary and conclusions of this research. Including introduction, this chapter is divided into seven main sections. Section 5.2 provides summary of finding for the research. Section 5.3 discusses policy implication for the findings of study is explained. Section 5.4 dedicates to limitations of the study whereas Section 5.5 presents recommendations for future study. Finally, Section 5.6 concludes the chapter.

5.2 Summary of Findings

The first objective of the study is recalled as assessing the resiliency of economy in the ASEAN – 5 countries. Economic resilience is pronounced, in term of the size of shock amplification and size of persistent. The result indicates that Thailand is the largest size of shock amplification in the ASEAN – 5 countries which is followed by Malaysia for period 1981 – 2014. It implies that shocks could exacerbate more output fluctuation from potential output than other the ASEAN – 5 countries. On other hand, Singapore and Indonesia has recorded to have a low shock amplification size. The lowest size of shock amplification goes to the Philippines. Therefore, the Philippines is the most resilient among the ASEAN – 5 countries in term of shock amplification.

On the result of shock persistent, Singapore seems to have the largest size of shock persistent in the ASEAN – 5 countries. It implies that a shock causes more prolonged output fluctuation from potential output in Singapore compared to other ASEAN – 5 countries. Meanwhile, the sizes of shock persistent in the Philippines and Thailand are much lower than Singapore. The lowest sizes of shock persistent in the ASEAN – 5 countries are Malaysia and Indonesia. A shock causes a less prolonged output fluctuation in both countries.

The second objective of the study is outlined as to examine the fiscal tools behaviour on economic resilience. The findings of long – run ARDL estimation on the models of study reveals that automatic stabilizers tool plays important role as shock absorber for all the ASEAN – 5 countries. The result indicates that the behaviour of automatic stabilizers for the ASEAN – 5 countries are countercycle in long run. Among these countries, the automatic stabilizers tool of Malaysia is the highest countercycle response which is followed by Thailand, Singapore, the Philippines and Indonesia. For discretionary fiscal, the long – run ARDL estimations reveal that discretionary fiscal tool is shock absorber in the long run for Malaysia, Singapore and the Thailand. In contrast, discretionary fiscal for Indonesia and the Philippines are appeared to be shock inducer that amplifies output fluctuation in business cycle. This study did further ARDL analysis to role fiscal tools in short – run. Automatic stabilizers tool is countercycle for all the ASEAN – 5 countries, meaning that this tools indeed play shock absorber role in short – run. Also, discretionary fiscal is found to be shock absorber in short run for all the ASEAN – 5 countries.

Eventually, the effectiveness of fiscal policy on economic resilience is highlighted as the third objective of study. By using long run estimation on ARDL error correction model error, the countercycle response of automatic stabilizers is increasing during AFC for all the ASEAN – 5 countries except, the Philippines. This means that automatic stabilizer is effective during AFC. Discretionary fiscal is found to be effective for Singapore and Thailand but ineffective for Malaysia, the Philippines and Indonesia. On other hand, the impact of automatic stabilizers during GFC is effective the ASEAN – 5 countries, except Thailand. In contrast, discretionary fiscal is found to be ineffective as the impact of this tool is decreasing during GFC.

5.3 Policy Implications

To be resilient, promoting economic stability during economic shock is the biggest challenges of ASEAN – 5 countries. Taking measure on financial sector to lower the risk of severe recessions is entirely appropriate to promote economic stability. Such a high financial market liberalization often yields a stronger economic growth, but also increases the risks of financial crisis and hence sever recession. The establishment of ASEAN Economic Community (AEC) since 2015 that provides a close financial integration between the ASEAN – 5 countries is an ideal way to moderate financial market liberalization. By mean of AEC, this region's financial integration gathers pace whereas, barriers to cross – border flows are gradually removed. This promotes a greater of capital flows shared among ASEAN members and at the same time, reduce dependence on capital

flows from others region. Therefore, it leads to reduce exposure of severe recessions from other regions.

Moreover, the persistent of global economic slowdown has been channelled to ASEAN – 5 countries through a high degree of economic openness. The formation AFTA should be strengthened in order to overcome the persistent of the shock. Vulnerability also comes from internal factors. Political turmoil for instance, should be avoided in order to maintain business confidence and investment climate. The ASEAN – 5 countries should practice more democratic system in their administration which allows smooth government transition without civil unrest and riot. By having political stability, it not only ensures government to function properly but, it promotes investor confidence, attracts more foreign direct investment which offsets the downfall of aggregate output during economic shock.

Furthermore, fiscal tools must be well – designed for specific target group to increase the impact of fiscal policy on economic resilience. To achieve this objective, fiscal and public expenditure management program (FPEMP) is coordinated assistance provided by the ADB to support government's focus on sustainable and inclusive growth. FPEMP would assist government to design public expenditure framework for specific targeted group including, the shifting universal subsidies to pro – poor targeted group, expanding the coverage of non – cash social assistant program to household and enhancing government service in delivering fiscal transfer and spending. FPEMP is expected to helm fiscal tools

to smooth AD for vulnerable group during economic crisis. Thus, it can enhance the impact of fiscal tools in stabilizing economy during crisis.

To promote the role of fiscal tool as shock absorber, ASEAN – 5 countries should to adopt the best practice in OECD countries. The best practice aligns performance budgeting expenditure with strategic economic goals. In this respect, central budget authority (CBA) is responsible to build internal capacity to guide the development of the performance budgeting system. The CAB continuously reviews and adjusts the operation of the performance budgeting system to improve its performance based on the priorities of the government on development. This practice, thereby can reduce the excessive government spending during non – crisis period. It will build some space for fiscal balance and increase the ability of fiscal to tool to be delivered during economic crisis.

As developing countries, the ASEAN – 5 countries need a continuous government spending to support their economic and social development during good time. It means that fiscal tools in the countries can be a procycle response during good time. In this respect, a well – managed in government spending countries during good time is a critical aspect to improve the ability of government in delivering sizeable fiscal tools during economic shock. A well – managed fiscal tools should aim for avoiding excessive discretionary spending during good time and enhancing efficiency in public spending. For instance, subsidies that benefit a broad populace including higher and middle classes would illustrate inefficiency of income in economy. By replacing the subsidies with benefits targeted to the poor will improve the efficiency in public spending. This well –

managed fiscal tools would buffer against excessive government spending and continuous fiscal deficit which improve the ability to deliver fiscal tools during economic shock.

A sound fiscal institution serves a vital role for the effectiveness of fiscal tool on economic resilience. The sound fiscal institution can promote the flexibility of fiscal tools to response to response to aggregate output shocks. In this regard, independent fiscal institution (IFI) that is a good medium to establish a sound fiscal institution. IFI have been practice by OECD countries over years. It pertains independent public institutions that critically assess fiscal policy performance. The core functions of IFI functions is providing macroeconomic and fiscal forecast and monitoring fiscal plans and outcomes. By mean of IFI, it can help to address biases toward spending and deficit and foster greater transparency in public spending which in turn, promote a well – designed of fiscal tools against economic shock.

To increase the effectiveness of fiscal tools on economic resilience, the ASEAN – 5 countries should concern on the ability of government to deliver sizeable fiscal tools. A sizeable fiscal discretionary and automatic stabilizers tools delivery during economic shock depends on the fiscal balance. In this respect, promoting saving in government spending could help the ASEAN – 5 countries to increase fiscal balance and enhancing the ability of government to impose fiscal tools during economic shock. Learning from the wide -ranging experiences of OECD countries, the government saving can be achieved through strengthening of market role by increasing the ability of market to incorporate available information about current and forecast market price. This can help the

governments to determine the price or cost of developed projects under fiscal tools which in turn, delivering the projects without excessive cost of transaction, achieving saving in government spending and increasing fiscal balance.

Also, improving public management can enhance the effectiveness of fiscal tools on economic resilience. In OECD countries, the decentralization of functional and fiscal responsibilities to sub – national government or state government seem to beneficial for the efficiency of public management. The decentralization of fiscal function provides incentives for sub – national government to deliver locally preferred public services more efficiently. Thus, fiscal policy through the decentralization would be more effective as the burden and benefits of public service well – targeted on society.

On other hand, institutional quality should be improved in order to increase the effectiveness of fiscal tools on economic resilience. For instance, promoting transparency in government budget is a key institutional driver that contribute to the efficiency of delivering fiscal tools during economic shocks. Transparency in government budget includes the practice of dynamic internal financial control by internal audit that monitors that prepare and disclose the misuse of government's liabilities and financial assets and non – financial assets. This practice ensures the allocation of government spending reach to targeted group and avoids political distortions on government spending. Meanwhile, anti – corruption and lobbying policy should be empowered with organizational leadership to foster a culture of integrity, the mandate formal audit on project implementation and the guidelines of work ethic for public officers. By mean of this

measure, the risk of corruption can be reduced in government spending that undermines the effectiveness of fiscal tools during economic shock.

5.4 Limitations of the Study

This study only concern about output gap that reflects economic stability as economic resilience indicator. Certain economic resilience indicators such as market efficiency, good governance and social development that was proposed by Briguglio et al. (2009) cannot be employed due to the availability of data.

Furthermore, there is also limitation for automatic stabilizers measurement based on the study of McKay and Ries (2013) such as tax rates and, government spending on social security and subsidies. This is because the data series is limit for 2000 – 2015 period. Therefore, the application of these measurement cannot be used in time series analysis since this analysis required data series to have at least 30 years.

Moreover, this study only covers for the ASEAN – 5 countries cases due to the availability of data for all the variables employed in other ASEAN countries. The missing data especially on government expenditure and government revenue cause this study limit the country sample size. This causes a limited the choice of using other panel estimation techniques that require a large size of sample size such as GMM, fixed effect model and random effect model can be used as comparison in order to provide a robust result.

5.5 Recommendations for Future Research

There are several recommendations for future research. Economic resilience for the ASEAN – 5 cases can be pronounced into output gap by economic sectors. It indicates to which extent actual output deviates from potential output during economic shocks across the economic sectors. The result of this study would show which sector is the least affected and the most affected during economic shock. The result also actually gives insight about the ability of an economy to reduce output losses by allocating employment from the most affected sector to the least affected sector during shock.

Beside fiscal policy, economic resilience is influenced by monetary policy. Future research should also focus on the role of fiscal policy on economic resilience. Central bank could dampen aggregate output to potential output by utilizing money supply and interest rate. Therefore, the comparison between the role of fiscal policy and monetary policy on economic resilience can give insight on which macroeconomic policy would have a greater effect on economic resilience.

5.6 Conclusion

As a conclusion, this study investigates the resiliency of the ASEAN – 5 countries to economic shocks, in term the size of shock amplification and the size of shock persistent. The results point out that each the ASEAN – 5 countries have different the size of shock amplification and the size of shock persistent which indicates that these countries have

certain reaction toward to economic shock. Furthermore, the role of fiscal tools is appeared to play countercycle response to absorb economic shocks by dampening output fluctuation toward potential output in long run. Moreover, the effectiveness of fiscal tools in the ASEAN – 5 countries can be seen by the reaction of output fluctuation toward potential output due to positive fiscal tools shock. In this regard, each the ASEAN – 5 countries have different reaction of fiscal tools on output fluctuation meaning that each the effectiveness of fiscal tools for each the ASEAN – 5 countries is varied.

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